8872 Manual

Agilaire LLC

Produced by Agilaire LLC

2904-B Tazewell Pike, Suite A
Knoxville, TN 37918
www.agilairecorp.com
info@agilairecorp.com

Support:
865-927-9440
support@agilairecorp.com

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Chapter 1

8872 Theory of Operation

8872 Theory of Operation – Hardware

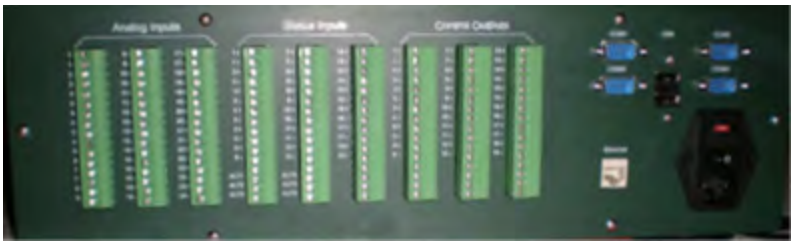
The Model 8872 is a Windows-based data logger, installed on XP Pro / Server 2003 or better (through Windows 7/8 or Server 2008R2). The 8872 includes a number of hardware and software features to ensure that the device matches the field reliability of the 8832, while offering the convenience of a Windows-based platform and integration with Agilaire's AirVision software.

The core of the 8872 is a fanless PC, typically 2 GB of RAM. The device can be equipped with a 160 GB standard hard drive or, more commonly, a 64 GB solid state flash drive (SSD).

Agilaire's new 8872 Data System Controller (Data Logger)

For all digital versions of the 8872, the remainder of the enclosure simply provides convenient USB, serial, and VGA I/O connections in a standard 3U rack mount enclosure, a form factor similar to the 8816 / 8832 family. However, the 8872 also supports traditional analog / discrete I/O via a variety of internal I/O modules and a protection / connector board to provide familiar detachable terminal block connections to the back. The layout of the connections is designed to make the unit easy to use as a 'drop in' replacement for an 8816 or 8832.

Up to six (6) I/O modules can be mounted internally, each consisting of either 8 voltage inputs, or a 6 status input / 6 relay output combination.

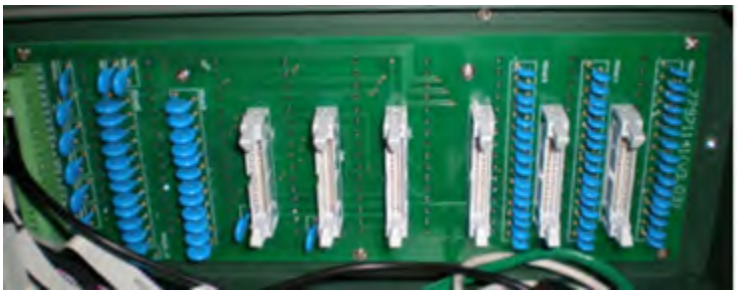


Back view of Agilare 8872

The rear panel PCB provides surge and overvoltage protection devices for up to 24 voltage inputs, 18 status inputs, and 18 relay outputs.

Status inputs can also be used for rainfall inputs or frequency/counter inputs (e.g., wind speed).

Additional external I/O can be connected via the rear panel Ethernet connector. External I/O modules are commonly used for specialty input (rainfall counters, RTDs, Thermocouples, etc).



8872 Signal Protection Board-an Agilaire Advantage

The rear panel also includes two (2) USB port connections and four (4) RS-232 port connections (COM1 through COM4). The front panel provides the primary network Ethernet connection and two (2) USB connectors. The device supports standard VGA monitors, USB keyboard/mouse, and most standard PC peripherals and drivers.

It is important to note that the rear panel Ethernet connector and the internal I/O modules run on a different network range (10.0.0.X) than the front panel Ethernet connector (whose IP address can be set by the user). For convenience, it is possible to request that Agilaire route the primary (user) Ethernet connection to the rear panel instead of the front panel. In this case, the front panel connector is disabled.

Hard Drive Emergency Partition

All Model 8872's are supplied with an emergency partition on the hard drive that can be used as a "return to factory" condition by rebooting and pressing F7 on a connected keyboard during the boot process. The restoration process, however, generally takes 2-3 hours, as it has to restore the entire hard drive image. This is normally only used in severe cases (e.g., OS file problems or virus corruption). Most normal concerns can be resolved by restoring the original database backup, stored in the C:\ root directory.

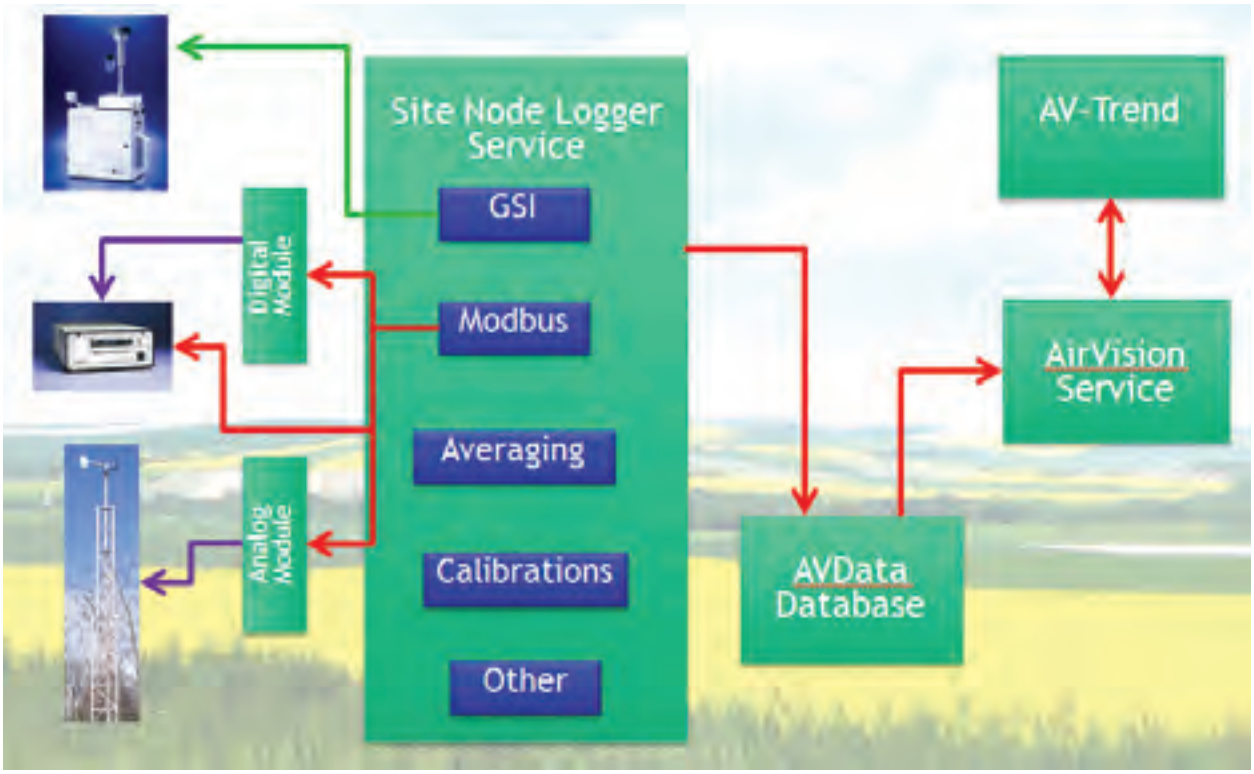
Theory of Operation – Software

While the AV-Trend software provides the interface for all configuration, reporting, data annotation, logbook, etc, it does not perform the realtime functions normally associated with the data logger, such as:

- Instantaneous scans of I/O, Modbus, GSI connections
- Short-term averaging and validation / flagging
- Calibration Control
- Short-term alarm generation with relay output control

To fulfill these requirements, the AirVision Service runs a plug-in called the Site Node Logger. The addition of this plug-in distinguishes an 8872 from an AV-Trend PC. This service scans the configuration within the 8872 (channels, calibrations, etc) and loads processes and threads to perform the realtim functions, inserting averaged data, calibrations results, etc, into the 8872 database at the required time.

The Site Node Logger operates at a general scan rate of 3 seconds (for internal I/O modules and external Modbus/GSI devices). Consult Agilaire for applications where higher scan rates are required.



Special Notes Regarding GSI / Modbus Channel Types (8872 vs. 8832)

Several improvements have been made regarding the handling of GSI and Modbus channels in the 8872, compared to its Model 8832 predecessor:

- Dongles are no longer required for Thermo analyzers and EcoTech analyzers
- GSI-based met channels no longer use the two-channel setup (GSI channel, then type V/W/7/8 channels)
- Sigma-Theta channels now use the "Input Channel" to point to the WDR channel, rather than having a duplicate analog input setup.
- Analog inputs default to 10V scaling. Changing the volts full scale for accuracy purposes requires the input to be changed manually through the input module's setup software (see Appendix A).

Some obscure functions of the Model 8832, rarely used in ambient applications are not supported, such as:

- Write to math constant (cal results, averages, etc)
- Math Pack channels (these are handled through AV-Trend math calculation tasks)
- DI-Triggered GSI Strings/Events

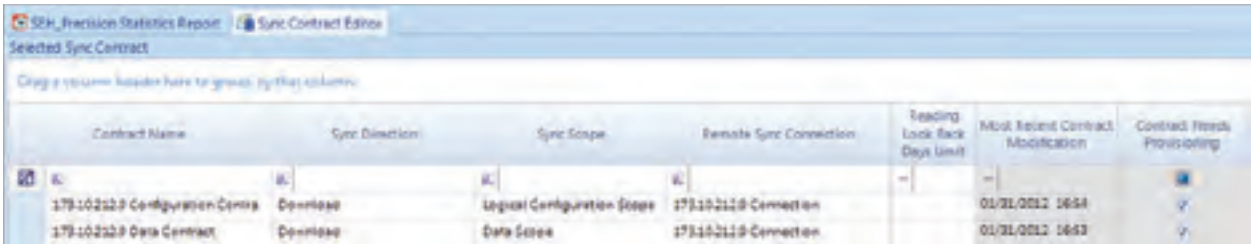
Initial Logger Configuration

By default, the 8872's configuration is pre-loaded with standard analog input channels and digital inputs/outputs to match the supplied I/O configuration. No Parameter records are entered, so the user can create new parameters to match the desired configuration (unused channels are ignored). The user may also need to use the **Change Channel Type** function in the **Channels Editor** to change channel types from the **Standard** calculation to other calculations (**Vector Wind, Sigma Theta**, etc).

This configuration can be done in the AirVision central as well, but an initial synchronization of the logger channels should be done before embarking on this.

- ⇨ **Important:** It is critical that the user should not create channels in the AirVision central that conflict with the channels already loaded in the 8872 before synchronizing. These channel configurations include internal ID codes that will not reconcile in this case.

If you want to:	*You should*:
Create parameters, cals, etc in AirVision, first	1. Create a sync connection and sync contract (download only). 2. Do initial sync. 3. Configure 8872 in AirVision 4. Change sync contract to either download/ upload or upload/download (make sure to specify only the site desired), and add data download sync.
If you want to:	*You should*:
Create parameters, cals, etc in 8872, first	1. Configure 8872 2. Configure sync connection and perform an initial sync (download only) from AirVision 3. Change sync contract to either download/ upload or upload/download (make sure to specify only the site desired), and add data download sync.



After the first configuration sync, you may elect to change this to either of the following:

- Download, Then Upload = apply changes in logger to central, then apply changes in central to logger
- Upload, Then Download = apply changes in Central to logger first, then apply changes in logger to central.

Special Notes Regarding Required SQL Configuration for 8872

- **TCP/IP Protocol** must be enabled using **SQL Configuration Tool**.
- SQL Server must be configured to allow **Remote Connections**.
- The "sa" account must be enabled (under **Security**) and the correct password must be set in the connection string.
- **Firewall** should allow **ports 1433 open** on the 8872, router, and intervening firewalls.

Normally, Agilaire sets all these defaults in the 8872, but the settings are repeated here in the event local IT staff changes the settings, or for users who want to use six-node logger software with their own PC hardware.

Reference

Default Internal Network Settings:

Internal I/O Module	*TCP Address*
Voltage Input 1-8	10.0.0.101
Voltage input 9-16	10.0.0.102
Voltage Input 17-24	10.0.0.103
Digital Input/Output 1-6	10.0.0.201
Digital Input/Output 7-12	10.0.0.202
Digital input/Output 13-18	10.0.0.203

Site Node Logger Service Error Log Location:

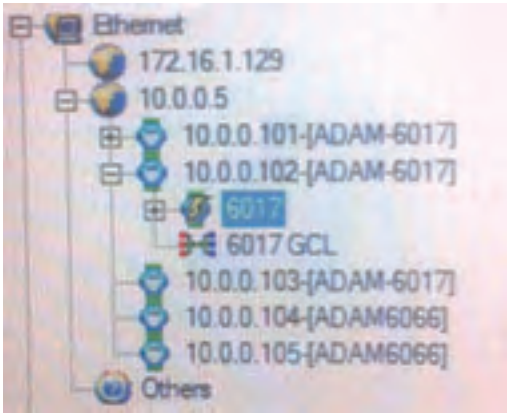
C:\Users\All Users\Agilaire\AirVision\Server\SiteNodeLogger

Troubleshooting

Symptom	*Check*
No new data coming into database, no data is visible on realtime display	1. Check **Windows Service Manager** (Start > Run > services.msc) to verify that **Site Node Logger** and **Watchdog** services are running. 2. If not, try to manually start service. 3. If service fails to start, locate **Logs** and email to Agilaire. 4. Also check **ConfigError** file in **Log Directory** for messages
New data comes in, but all values are marked “0<”.	1. Verify that secondary network **IP address** is set to **10.0.0.5, with Gateway 10.0.0.1**. 2. Use **Start > Run > cmd** to open DOS window and try to **ping** each of the internal I/O modules at the IP addresses given above. 3. If ping fails for **one module**, check **internal Ethernet wiring** for faults. 4. If ping fails for **all modules**, check **internal Ethernet switch** for power indication and connection lights. 5. If service fails, locate **Logs** and email to Agilaire. 6. Also check **ConfigError** file in **Log Directory** for messages
New data comes in, some values are marked “<”, but values are coming in and some averages are not flagged.	Check **Modbus** device scan rates in the 8872, **Configuration >Channels >Modbus Instruments**. Scan rates should be set to “30” unless otherwise directed by Agilaire.

Changing Volts Full Scale Settings

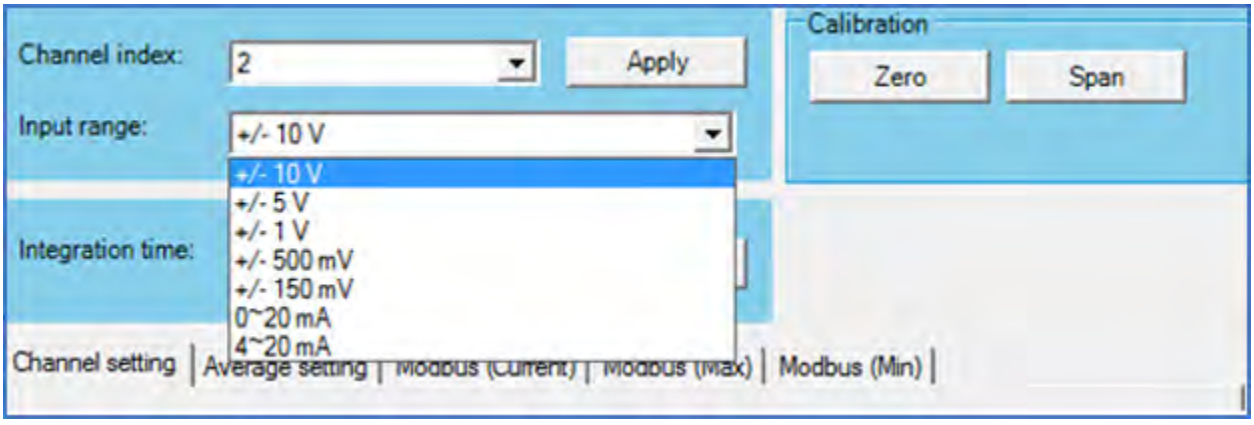
The analog inputs are factory defaulted to 10 volts full scale. In some cases, it is desirable to change the volts full scale to improve accuracy (for a 0-1 or 0-100mV instrument). To make this change, open the ADAM/APAX administration utility under the Start Menu. The left side menu should populate with the installed modules and their IP addresses (Modules 1 through 3 10.0.0.101 through 10.0.0.103), and correspond to input cards 1-3 accordingly. If they do not immediately appear, right click on **10.0.0.5** and select **Search**.



Volts Full Scale

Select the card (module) and expand to show the **6017 watch** icon. You will be asked for a **Password**- enter eight zeroes (**00000000**).

You will then see a list of the inputs, including their current readings. On the top pick list, pick the appropriate index (0-7 = Inputs 1-8 on the first card, 9-16 on the second card, etc). To recap, if we want to change the range on analog input 11, we would choose the module 10.0.0.102 and Index 2. Once you have selected the correct index, select the Input Range.



Select Input Range

Click **Apply**. Continue with any other range changes, then close the APAX application. You will also need to ensure that the **High Out / Low Out** in **Data Source Details** is set correctly. The **High Out** corresponds to the new full scale range, and the **Low Out** corresponds to a zero reading.

Chapter 2

Logger-Central Communications

Although the Model 8872 itself is a fully capable stand-alone reporting platform, in most architectures the Model 8872 is connected to a Central Server or Data Management System (DMS) as the final repository of the data for multiple sites. The Model 8872 has three main communication methods for transferring data back to the Central/DMS:

7 - in this mode, the Model 8872 emulates a Model 8816/8832 for data polling. It can be used for both legacy dial-up modem networks or TCP/IP networks. However, configuration download is not supported.

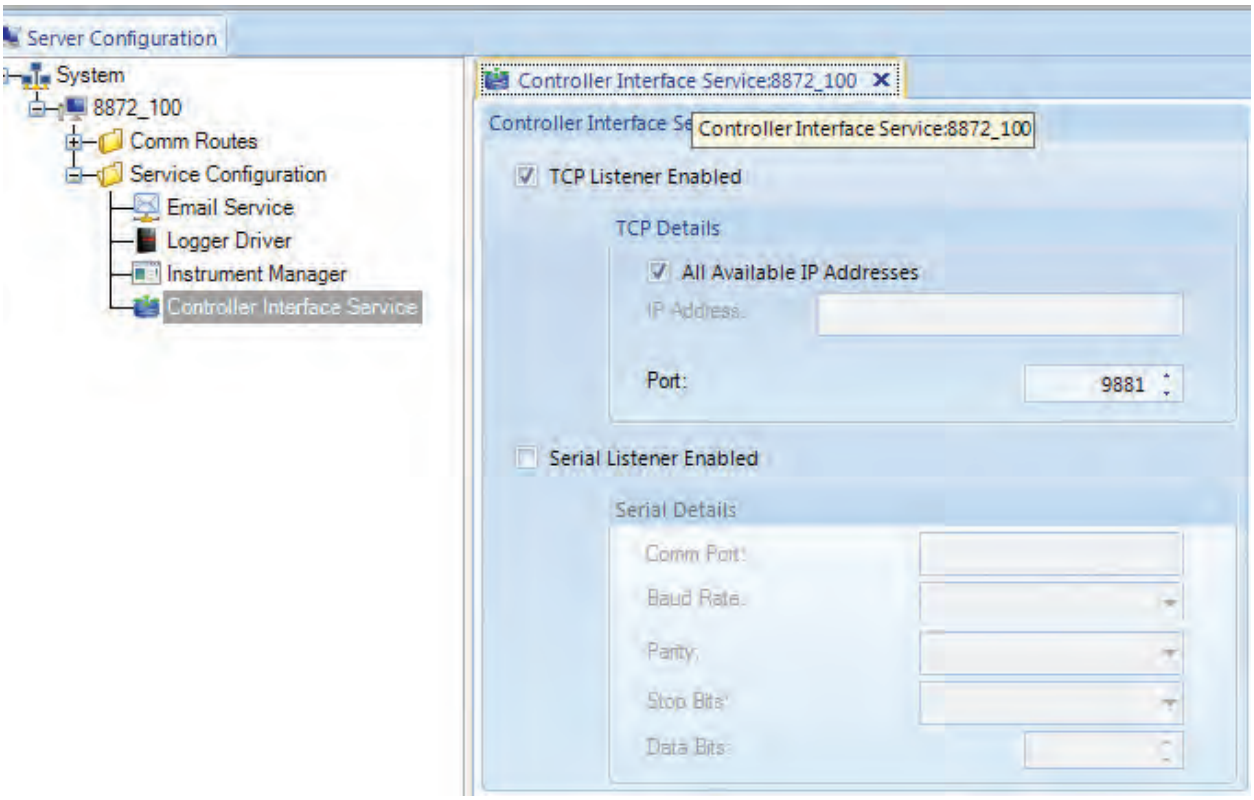
- FTP Push - This mode is more commonly used in TCP/IP networks where the a public/static IP address is not available for the remote site. In this mode, the Model 8872 pushes files back to the Central/DMS on a regular basis.
- SQL Sync - This mode is more complicated to set up, but allows for full two-way synchronization between the two databases over a TCP/IP connection. It can be used for transfer of configuration settings (bidirectional), upload of data to Central/DMS, or both.

Note that the modes can be mixed - for example, SQL Sync can be used for upload/download of the configuration settings, but the user may choose to use the Controller Interface Service for faster data polling. In fact **this mode is the recommended mode for most Model 8872 installations.**

Controller Interface Service

The Controller Interface Service is a background service in the Model 8872 that allows the logger to emulate a Model 8832 for polling purposes. It supports all data polling (averages, cals, messages, power failures, etc), but does not support configuration download messages.

The service is normally enabled for each Model 8872 at the time of shipment, and can be found in the PC Configuration settings:



If it is not visible, you may right-click on the PC icon with the logger name, and add the "Controller Interface Service" to the list of plug-ins.

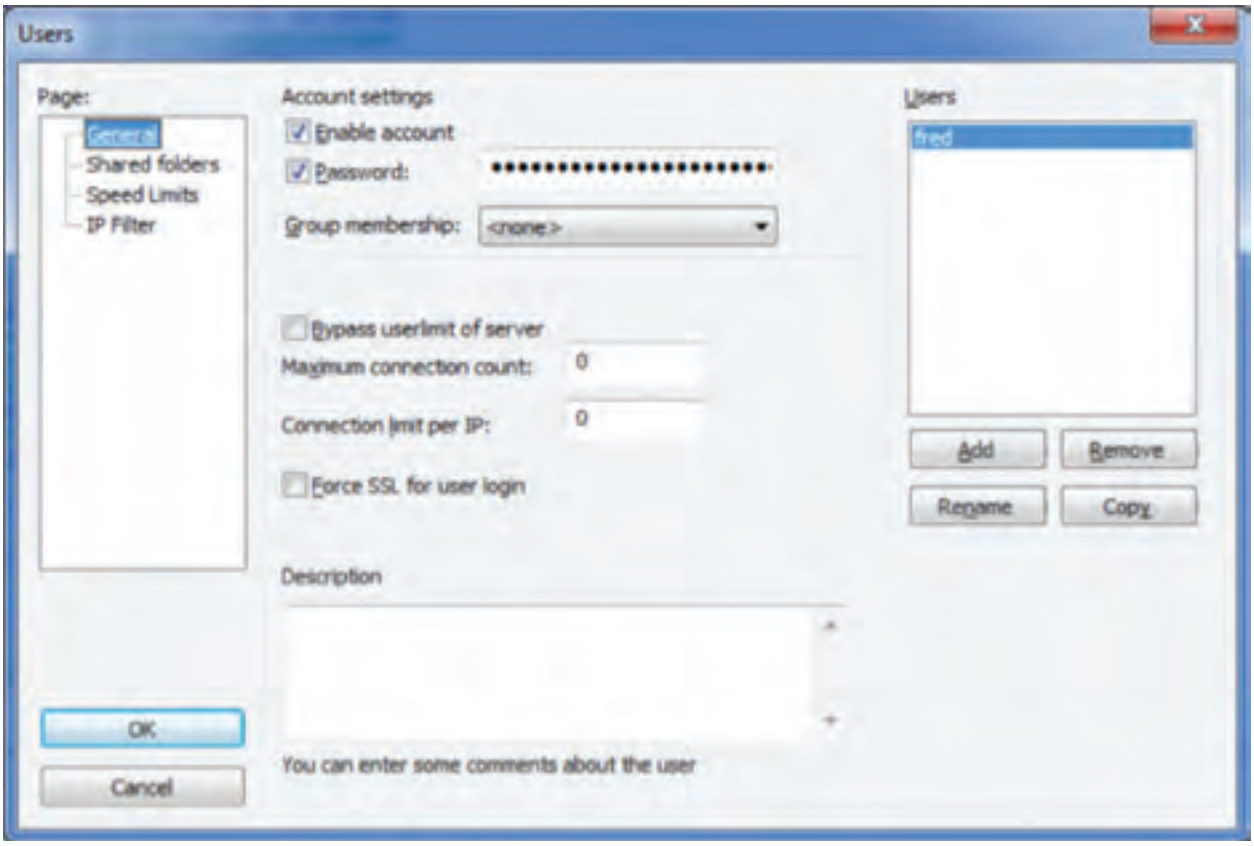
By default, the logger will listen for polling strings on port 9881, but this port may be changed if needed. The service can also be set to listen for polling commands on a serial port (e.g., COM1, COM2), but that port **may not be used for any other function**, such as direct instrument polling or Generic Serial Interface (GSI).

All incoming messages and generated responses are viewable in the Log Viewer (Utilities).

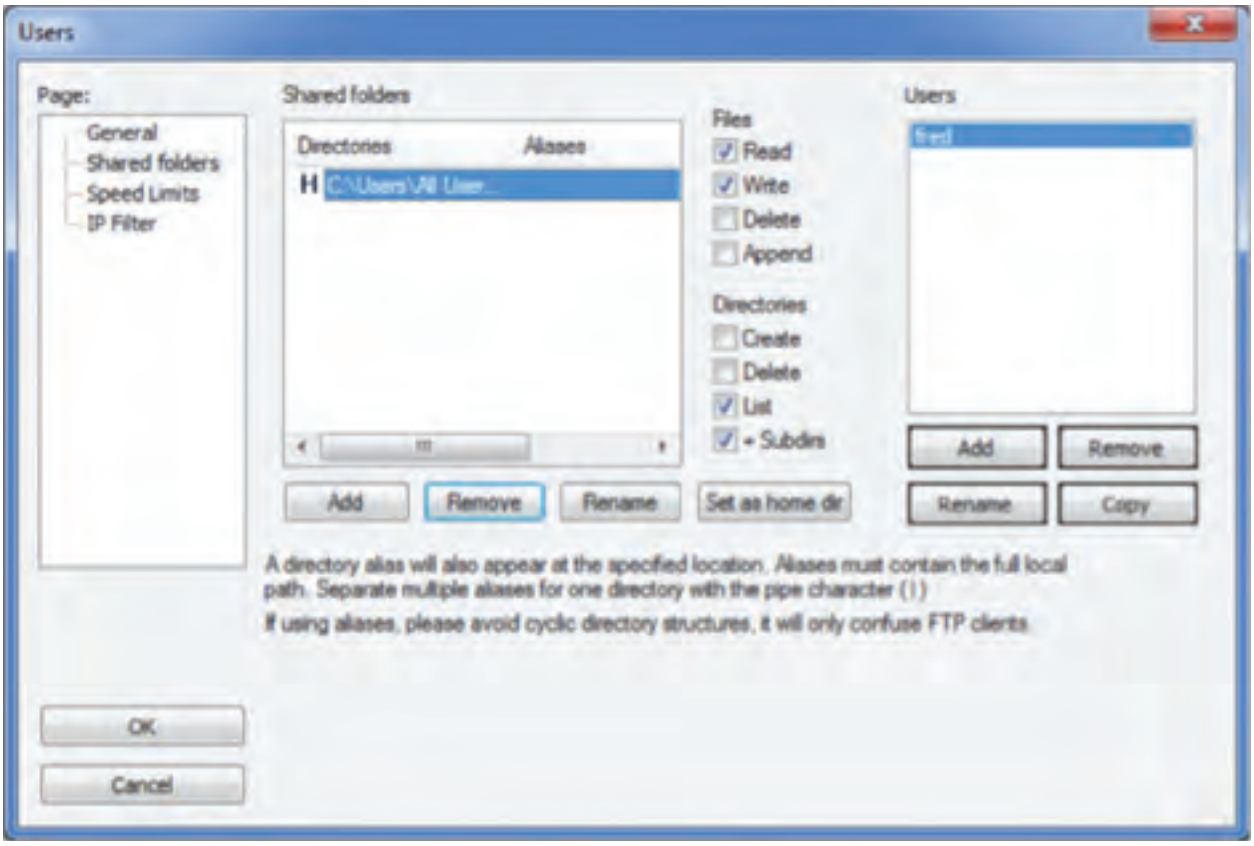
Setting up AirVision Server to Receive FTP Push (Version 2.6.11 and Higher)

Install FileZilla FTP Server, set to run as background service automatically.

Start FileZilla manager (accept default logins) and use the Users button and **Add** to create a new user. Set username and password. You will set up a unique user for each Model 8872 out in the field.

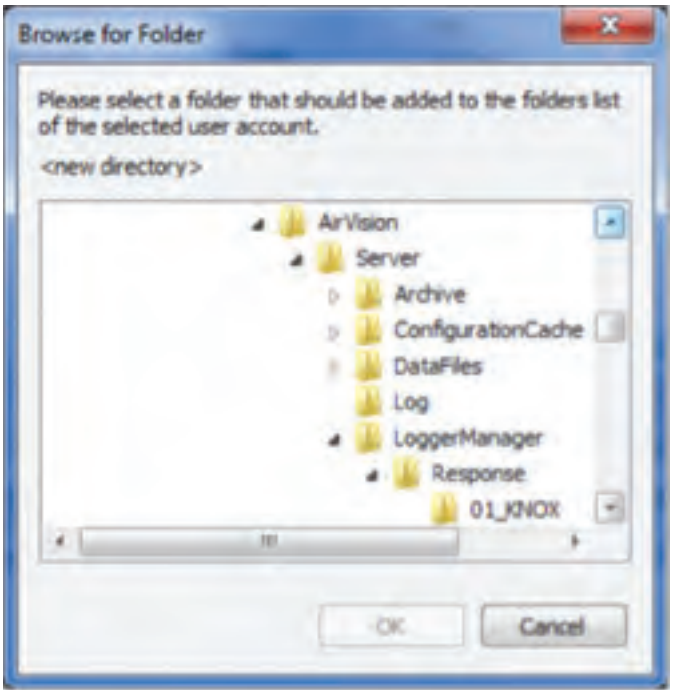


Once you have created the user, select the **Shared Folders** button.



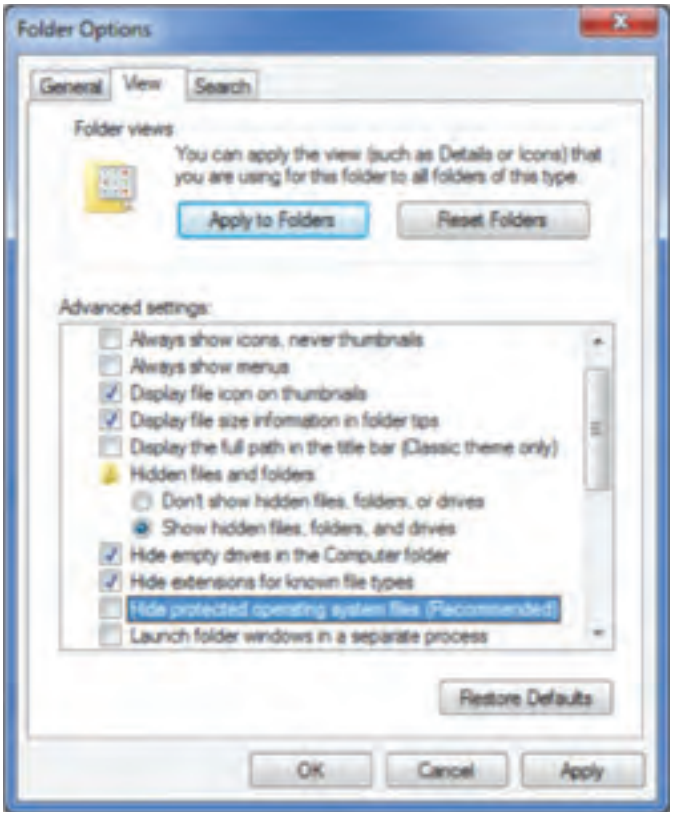
Use **Add** to create a new home directory for the user. Navigate to **Users->All Users->Agilaire->AirVision->Server ->Logger Manager->Response->(Site Name)**.

Make sure to define the user as having both read and write privileges.

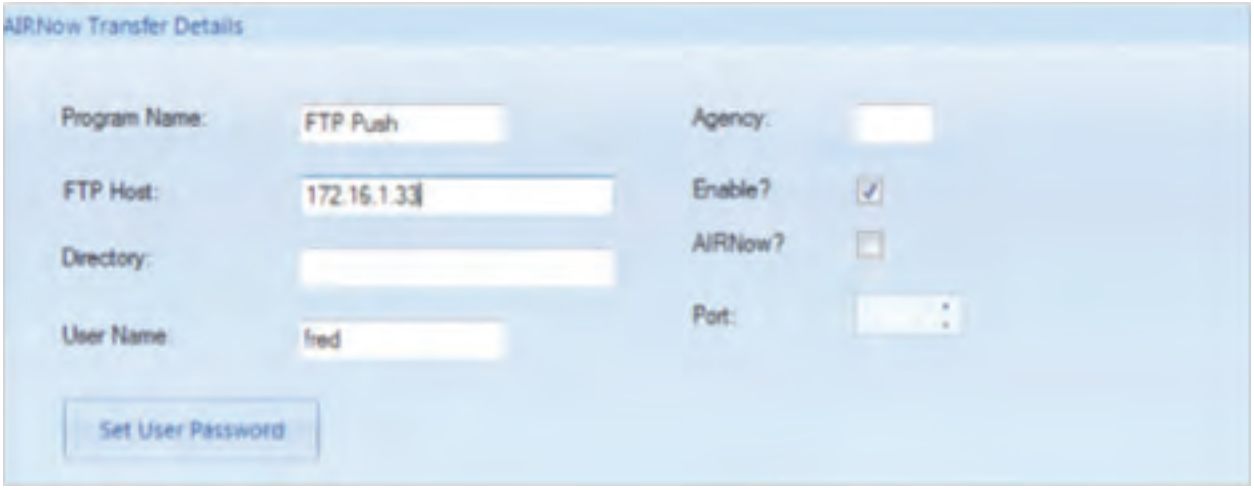


If you do not see **All Users**, you will need to open Windows Explorer and select **Organize-> File and Search Options**, and de-select **Hide Protected System Operating Files**. Once you have done this and selected **Apply**, you can re-open the file browser in Filezilla to re-select the desired folder.

Repeat this process for each site, creating a unique user for each site. *(Alternatively, you may choose one user and use the "Response" level as the home directory. In this case, in the FTP transfer program for the site, you can choose the appropriate subdirectory for the site).*

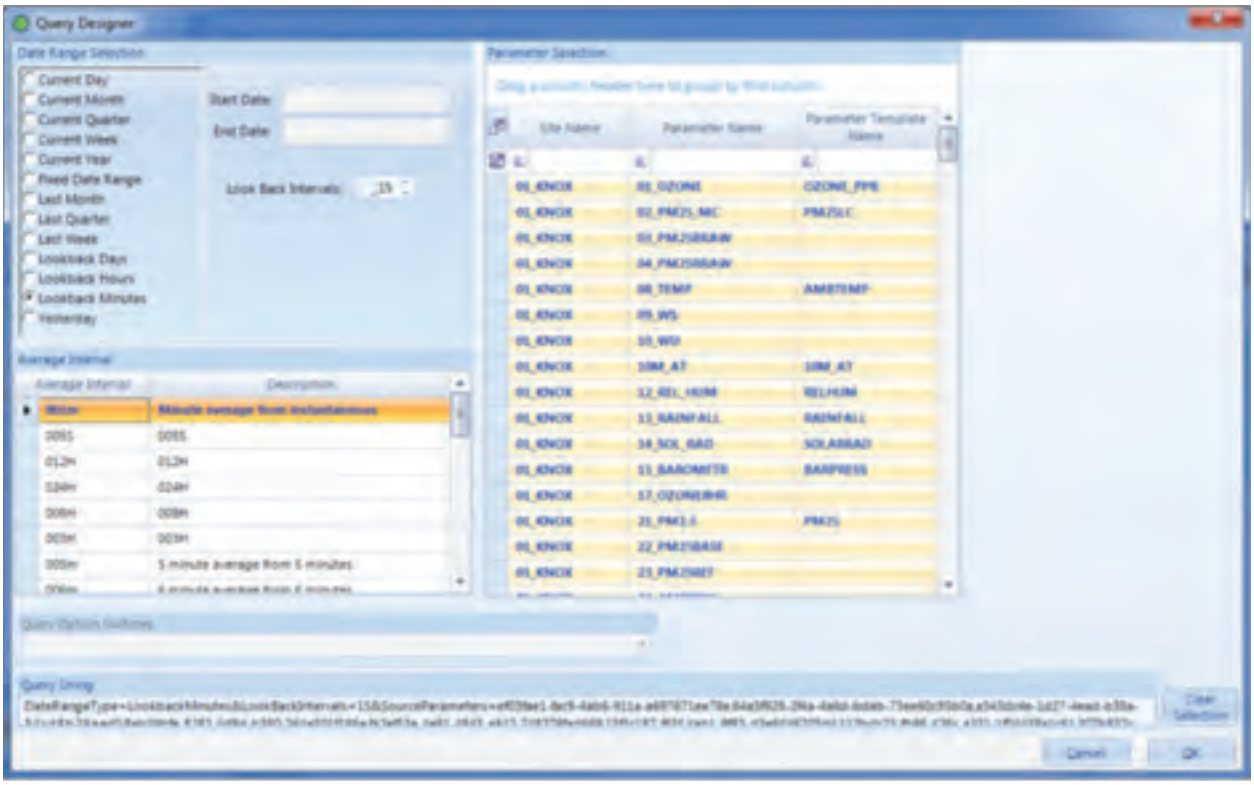

Folder Options
General
View
Search
Folder views
You can apply the view (such as Details or Icons) that you are using for this folder to all folders of this type.
Apply to Folders
Reset Folders
Advanced settings:
Always show icons, never thumbnails
Always show menus
Display file icon on thumbnails
Display file size information in folder tips
Display the full path in the title bar (Classic theme only)
Hidden files and folders
Don't show hidden files, folders, or drives
Show hidden files, folders, and drives
Hide empty drives in the Computer folder
Hide extensions for known file types
Hide protected operating system files (Recommended)
Launch folder windows in a separate process
Restore Defaults
OK
Cancel
Apply

When this is done, you can create FTP programs in the Model 8872 (**Configuration->Report Configurations->FTP Programs**). Define the IP address or resolvable name for the Central PC you are pushing to, and enter the user name and password. Leave the other fields blank.



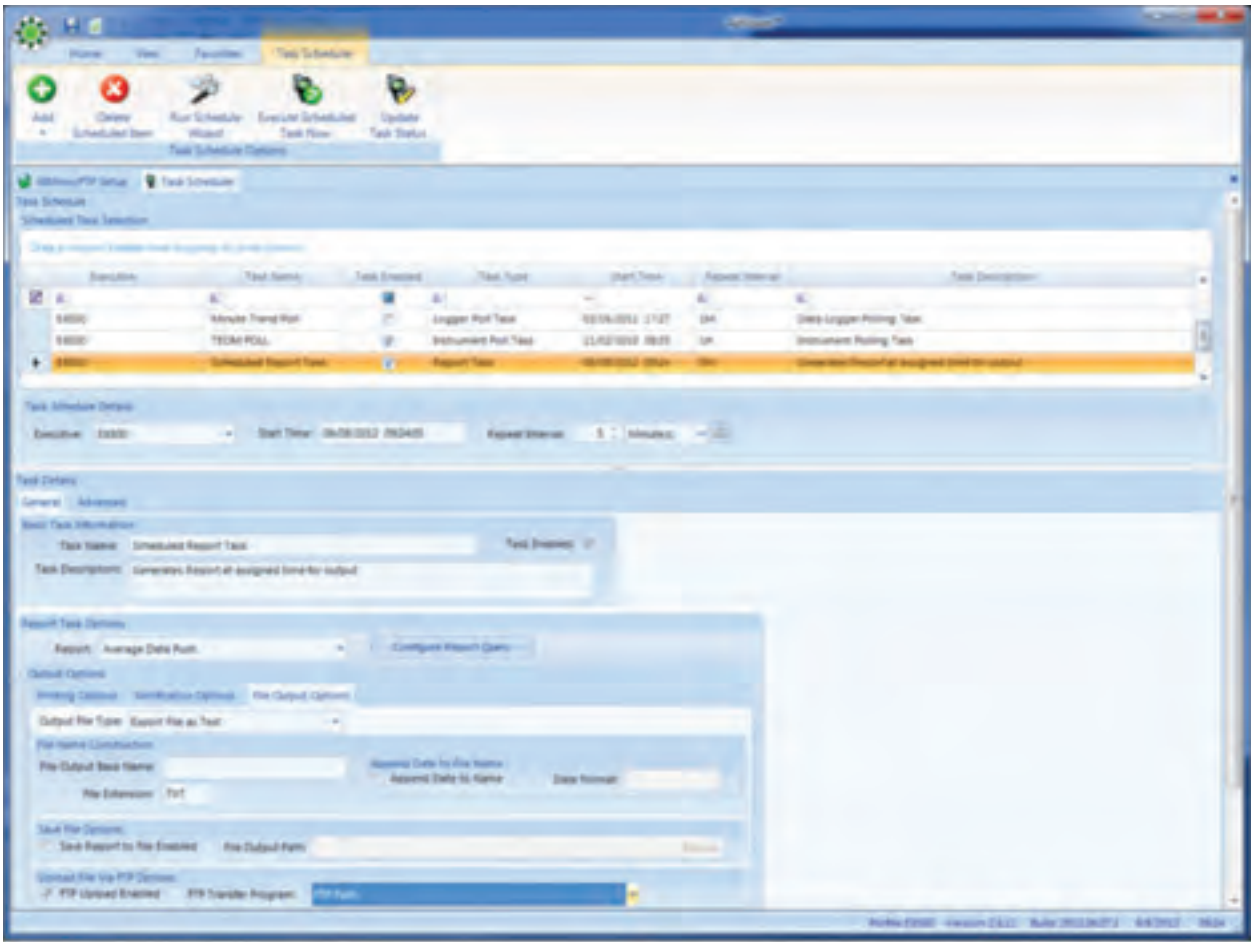
To create the individual push tasks, use **Configuration->Task Scheduler** and **Add->Scheduled Report Task** to choose any of the **Push** type reports. (Push Average Data, Push Calibration Data, etc). You may also wish to create **Group Task** and put all the **push** tasks under the group task for easier management.

Use the **Configure Report Query** button to choose the desired parameters, intervals, etc. for each push task. For the Date Range, we would recommend using **Lookback Minutes** and setting the lookback to a value equal to or greater than the task execution frequency (e.g., if pushing data every 5 minutes, set the lookback to at least 5 minutes). If the logger is polling another device through Instrument Polling (e.g., BAM), consider adding enough overlap to handle short-term communication outages to the other device.

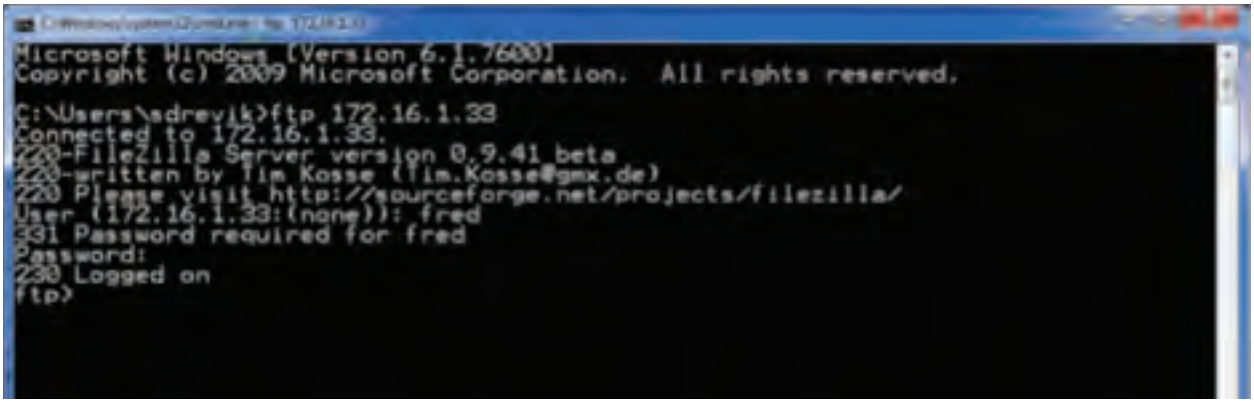


Note that for average data, you will need to make a push task for each averaging interval.

Finally, in the task, select **File Output Options**, select **FTP Enabled**, and choose your FTP program that you created earlier. You should define the file extension as RSP. You can choose anything you want for the file name. It is recommended that you select **Append Date To Name**.



Click **Save** and let the server restart. Pushes will start, and can be reviewed in the Scheduled Task Status display If you encounter any FTP problems, test the connection from the 8872 by going to a DOS prompt and manually initiating an ftp:



Central - Remote Sync Setup

While the Model 8872 can be polled in the same manner as a Model 8832, the Model 8872 also supports a database-to-database synchronization. The advantages of this approach are:

- For configuration, bidirectional update of settings, so that changes made either in the Central or in the Model 8872 are reflected on each end.
- For data, annotations, data edits, flag changes, and such made at the Model 8872 are transferred to the Central.

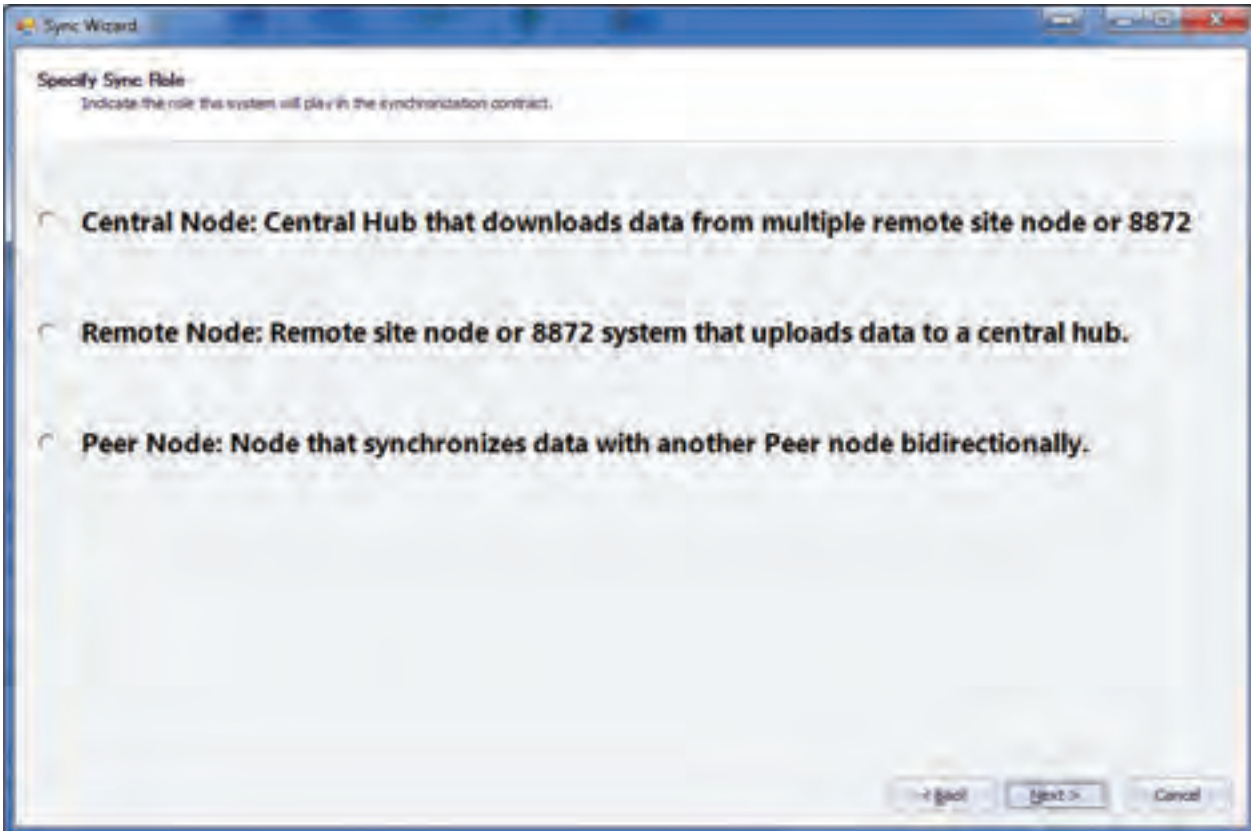
However, the bandwidth usage of the sync for data is considerably more than polling, so if the remote/site users are not expected to be editing data, Agilaire recommends just implementing the Configuration part of the sync, but using the regular Model 8832 emulation polling (see "Controller Interface Service", following this section) for data collection.

The procedure to configure the synchronization in AirVision is as follows:

- To enable **Synchronization**, the AirVision Central must have the **Microsoft Sync Framework** loaded. This can be downloaded from the Agilaire FTP site, or from Microsoft.
- Only the **Synchronization Tools** and the **Database Providers** needs to be installed. Make sure to install the proper version (x86 for 32-bit or x64 for 64-bit) for your version of SQL Server.
- To set up the synchronization tasks, you can use the **Sync Connection Wizard** in the **Configuration > Sync Menu** at **AirVision Central**.

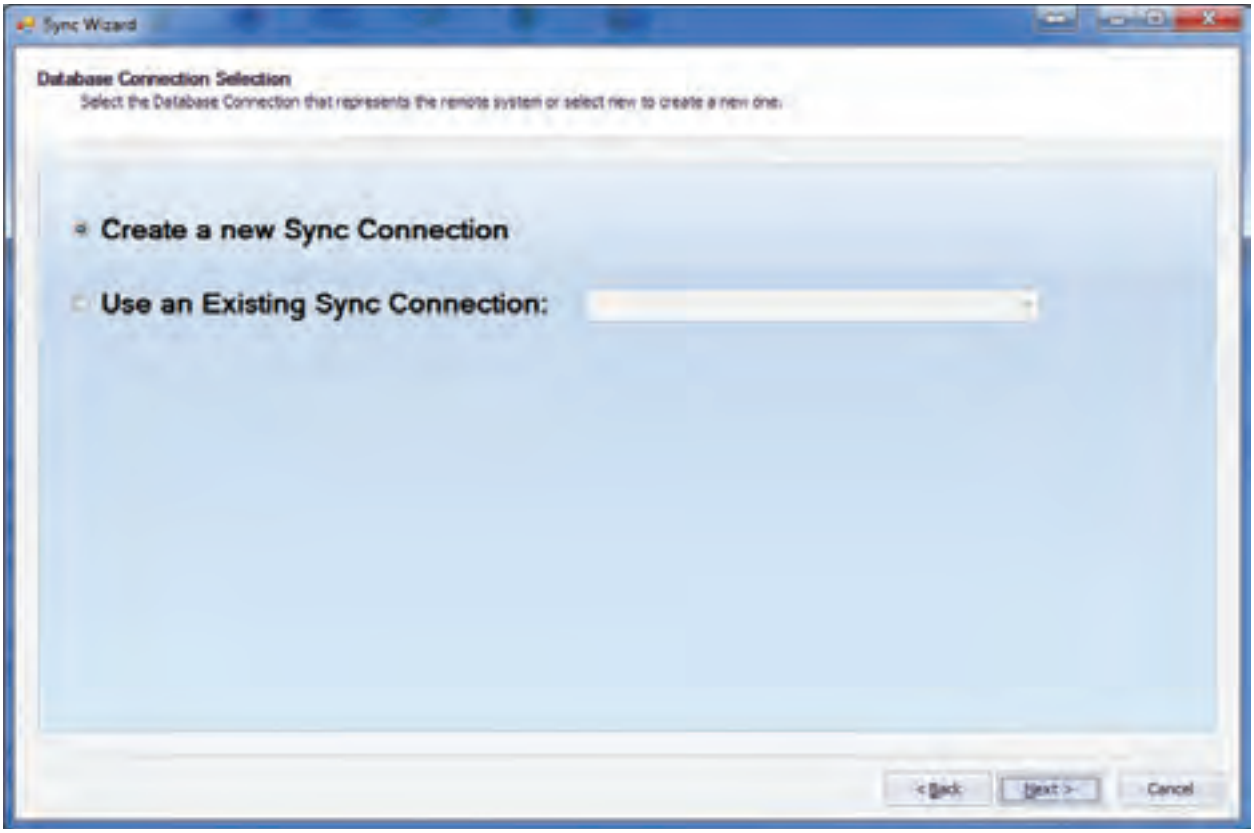
Sync Connection Wizard

The Wizard will first ask you to define how you plan to use the synchronization system:

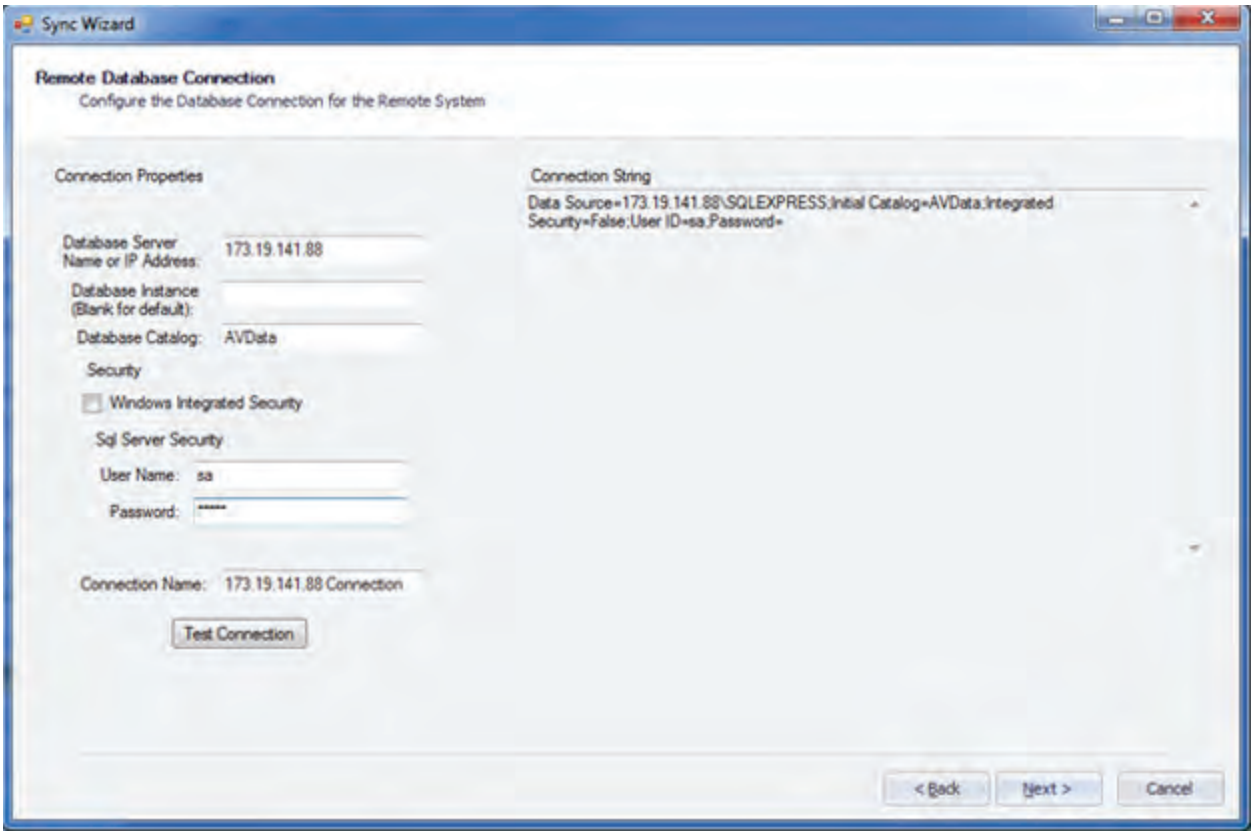

Sync Wizard
Specify Sync Role
Central Node: Central Hub that downloads data from multiple remote site node or 8872
Remote Node: Remote site node or 8872 system that uploads data to a central hub.
Peer Node: Node that synchronizes data with another Peer node bidirectionally.
< Back
Next >
Cancel

The first option (where Central controls the synchronization) is more common. The second case (the “push” case is usually reserved for systems where the remote site IPs are dynamic and behind a proxy server. Consult Agilaire's engineering staff for use of the third mode (peer-to-peer).

Assuming the selection of the “Central Node” mode, we are then asked to define a new or use an existing connection:


Sync Wizard
Database Connection Selection
Select the Database Connection that represents the remote system or select new to create a new one.
Create a new Sync Connection
Use an Existing Sync Connection:
< Back
Next >
Cancel

The “Use Existing Connection” selection is only used if you have already set up Sync, and wish to add a new type of data exchange (e.g., adding data sync if you originally only set up configuration sync). If you set up a new connection, you will be asked to define the configuration details:

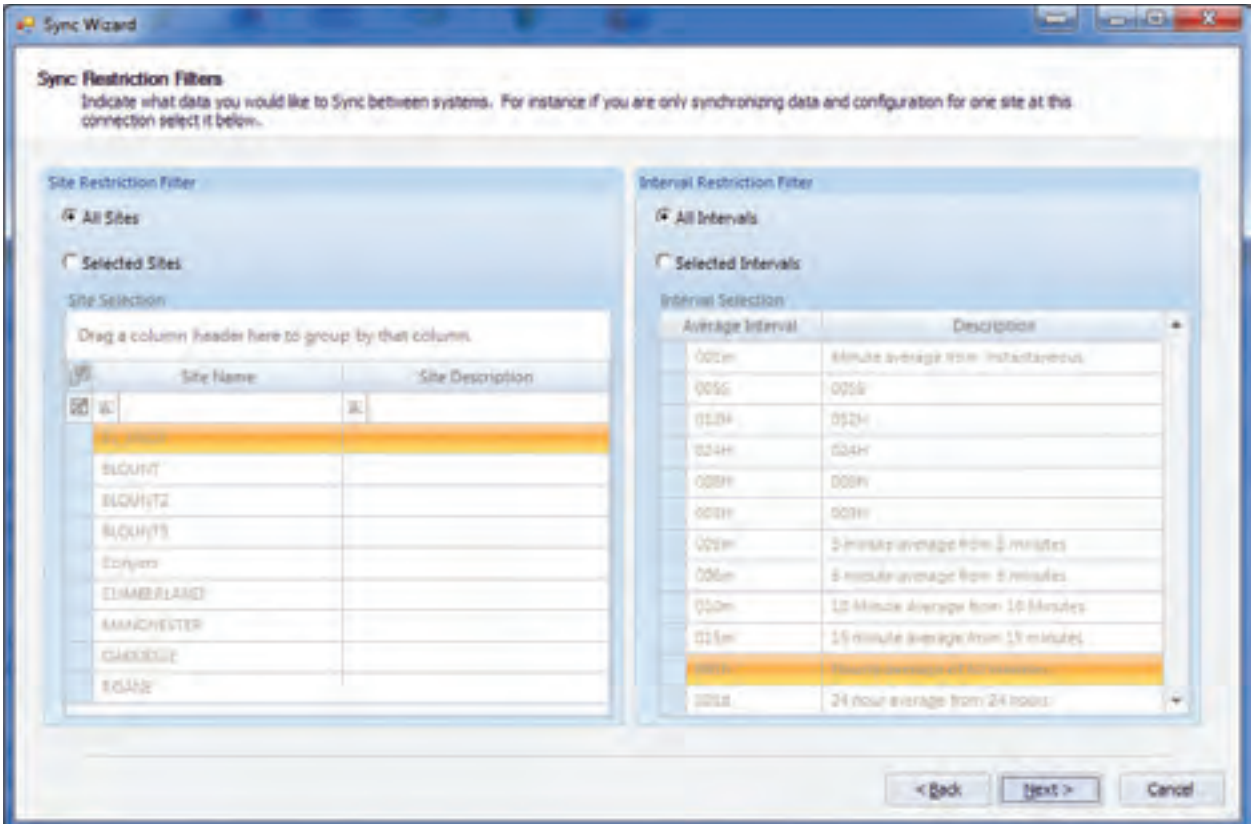


- Define the **Database Server**, which will typically be the public IP address of the monitoring site (the router will be programmed to pass through SQL port 1433 to the 8872). In some cases, it may be necessary to add ",1433" to the IP address.
- The second field asks for the name of the **Database Instance**, typically left blank for 8872 systems.
- Last, define the **SQL Login Username (sa)** and **Password**. (Contact Agilaire or your 8872 distribution documentation for default SQL passwords).

The **Test Connection** button in the Sync Wizard can be used to test the connection
If you have difficulty, the following troubleshooting steps can be helpful:

- In **SQL Management Studio**, use the same settings (IP address, instance name, username,password) to try to connect to the remote site.
- Use **TELNET** to try to open a basic TCP connection the site IP address and the designated port (or the default port 1433).
- Verify Windows Firewall settings and exceptions, ensure exception exists for port 1433.
- If the connection is refused, check router settings or check SQL settings to confirm which IP port is being used.

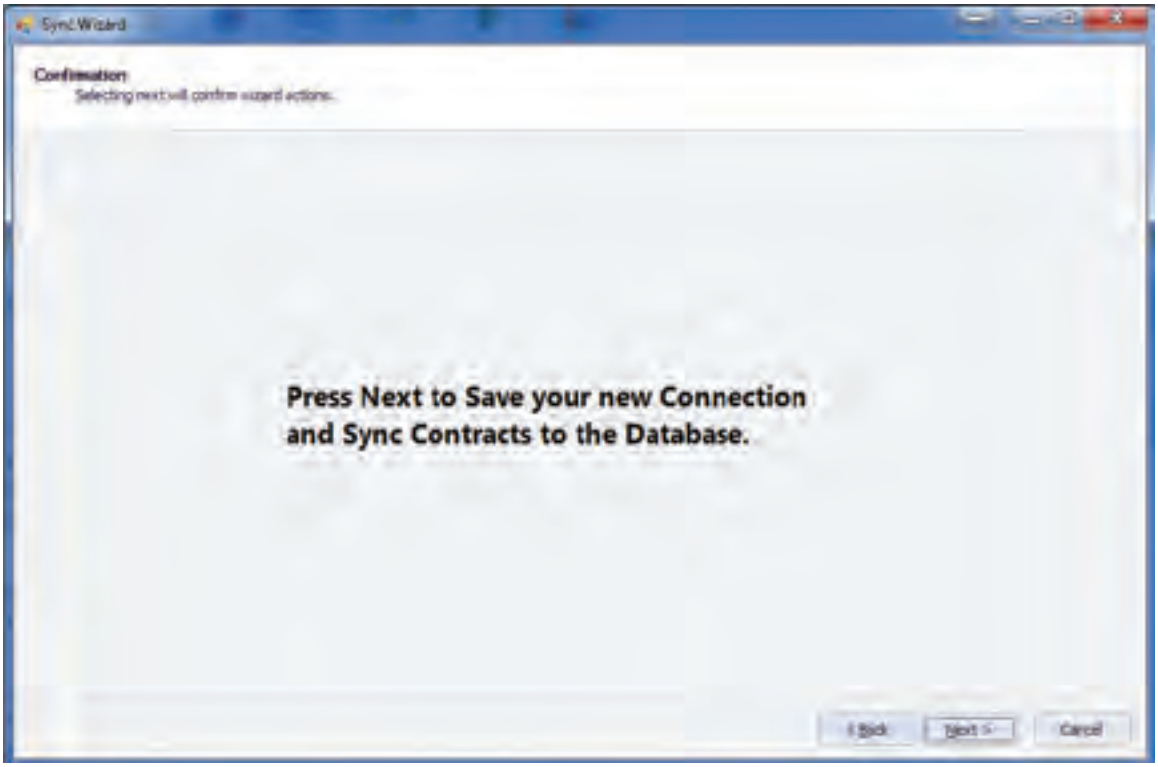
The wizard will set up two default sync contracts: **Configuration** and **Data**. Even if you don't plan to use the data contract, you may leave it set up (and simply not run/schedule it). On the next page, you will be shown a list of sites and parameters for which you may filter for this contract.


Sync Wizard
Sync Restriction Filters
Indicate what data you would like to Sync between systems. For instance if you are only synchronizing data and configuration for one site at this connection select it below.
Site Restriction Filter
All Sites
Selected Sites
Site Selection
Drag a column header here to group by that column
Site Name
Site Description
Interval Restriction Filter
All Intervals
Selected Intervals
Interval Selection
Average Interval
Description
< Back
Next >
Cancel

Usually, for each connection, you will filter by the site that is associated with that connection. However, for most 8872 systems, you will not have the site visible, since you have not synchronized with it yet (this screen is more commonly used for peer-to-peer arrangements).

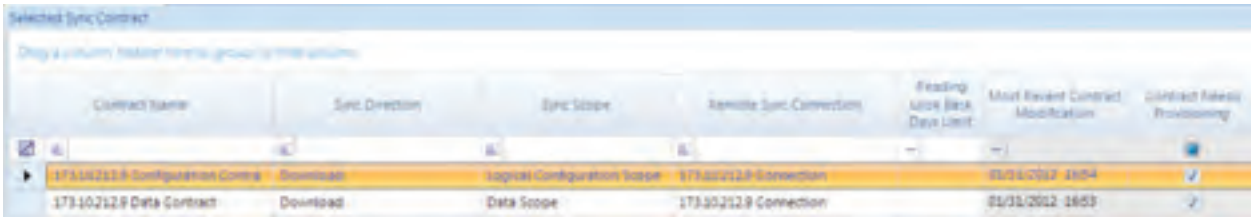
▶ **Note:** If you have already configured the site in AirVision, and wish to synchronize with a new Model 8872, contact Agilaire Support for additional guidance.

This last screen in the wizard confirms that you wish to save your changes:



First-Time Model 8872 Synchronization

Per the instructions above, you may want to go later into **Configuration Editors > Sync Contract Editor** to change the contract for the initial synchronization.
Change the Configuration contract to "download", and ensure the Data contract is set to "Download" as well. Then save, and go to **Utilities->Sync->Database Sync** for your first synchronization. Initial configuration sync should take one to five minutes. First time data sync may take 10 minutes to several hours, depending on the size of the databases on each end.



After the first configuration sync, you may elect to change this to either of the following:

- Download, Then Upload = apply changes in logger to central, then apply changes in central to logger
- Upload, Then Download = apply changes in Central to logger first, then apply changes in logger to central.

Chapter 3

Configuring the 8872

The 8872 provides nearly unlimited flexibility in setting up systems and configuring servers. This chapter explains how to set up the following parts of the 8872:

- Configuring System Preferences
  Configuration Editors > Parameter Settings
- Configuring Server Preferences
  Configuration Editors > PC Configuration
- Setting up Sites and Parameters
  Configuration Editors > Parameter Settings
- Configuring Parameter Templates
  Configuration Editors > Parameter Template Editor
- Adding Loggers to Sites
  Configuration Editors > PC Configuration
- Adding Channels to Data Loggers
  Configuration Editors > Logger Channels
- Setting up Calibrations
  Configuration Editors > Logger Channels
- Scheduling Tasks
  Configuration Editors > Task Scheduler
- Adding Users
  Configuration Editors > Security > User Editor
- Adding Favorites
  Configuration Editors > Favorites Editor

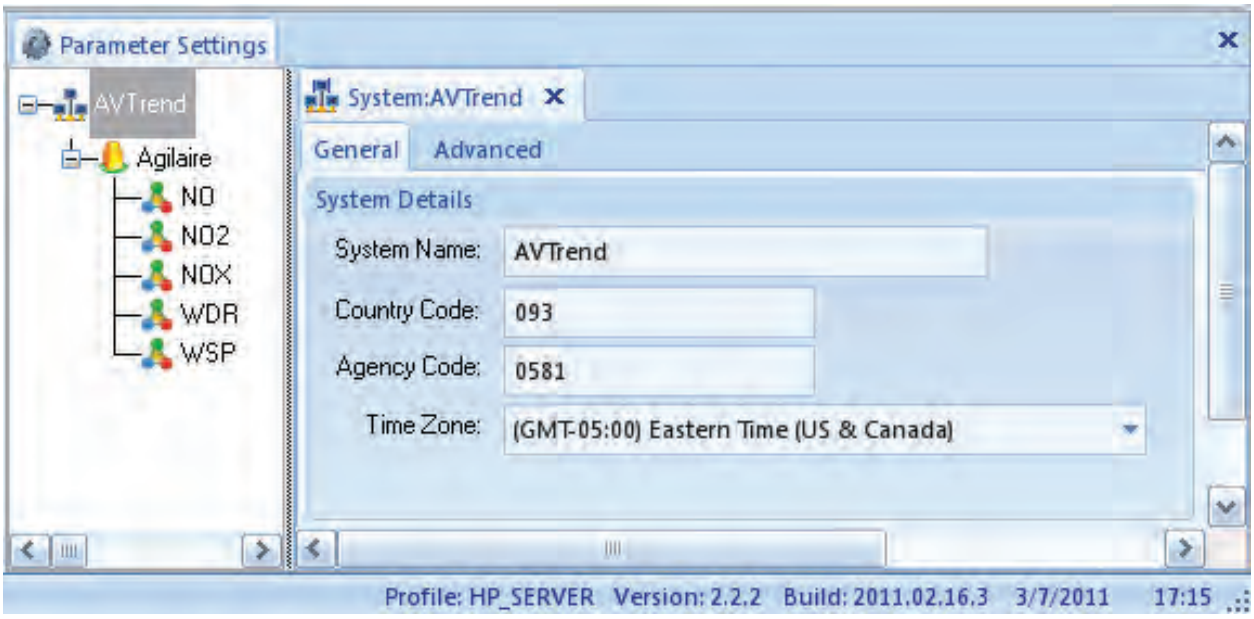
Configuring System Preferences

To set up system preferences, open **Parameter Settings** from **Configuration Editors** and double-click the **System** icon. The System is the agency or area, such as Knox County or State of Tennessee. Typically, each agency setup will only have one System (a second system could be used to help separate, for example, air toxics or water quality data from the other quality data), but it is possible to set up more than one by clicking the **Add System** button on the ribbon.

Verify that the **Time Zone** is correct. The other fields (listed below) are optional, and typically used only if your license includes full Ambient reporting:

System Name
County Code
Agency Code (provided by EPA)

Click the **Save** button.



System Configuration from Parameter Settings Editor

▶ **Note:** These settings are NOT sychronized from Central and must be set manually.

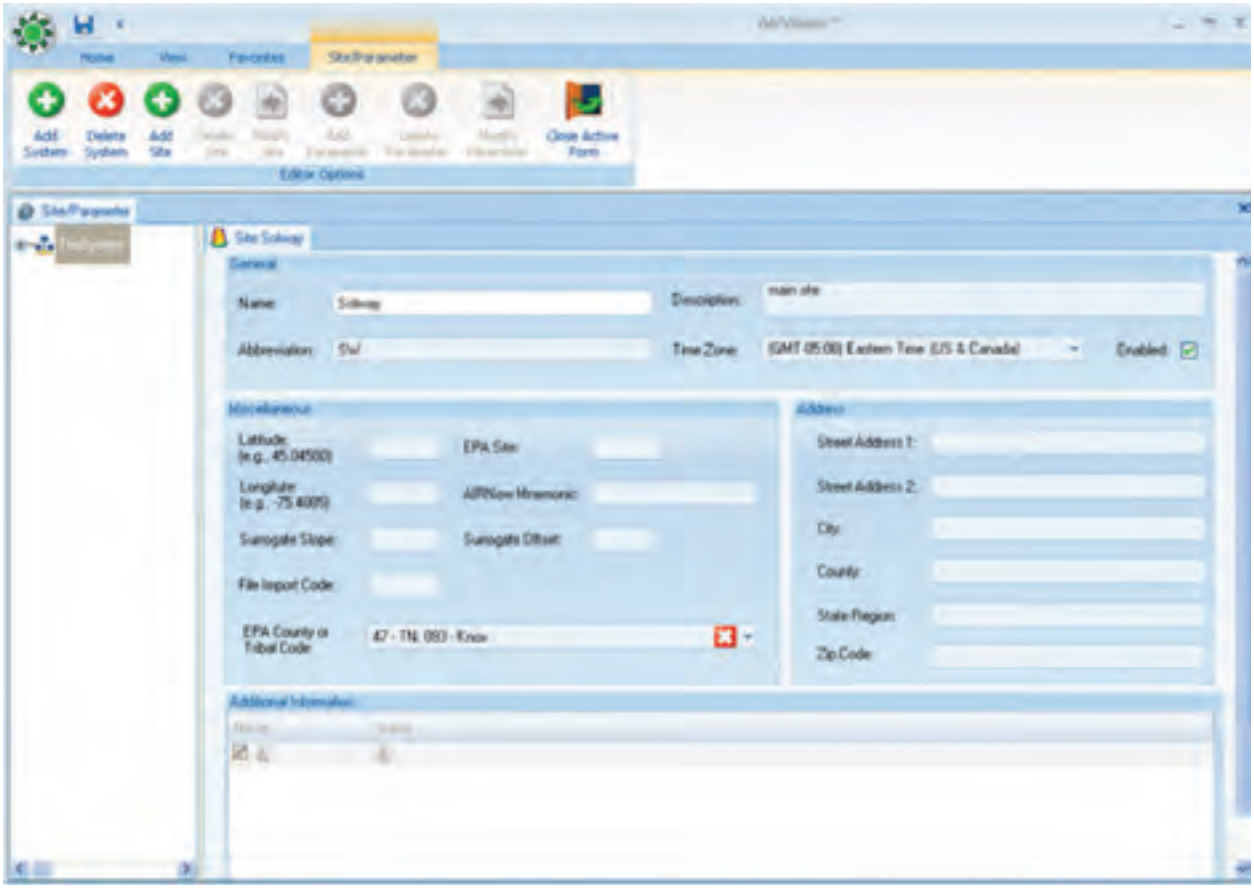
Site and Parameter Setup

The **Parameter Settings Editor** from the **Configuration Editors** menu allows administrators to add, edit, and delete sites and parameters. For the Model 8872, you should only have a single Site represented.

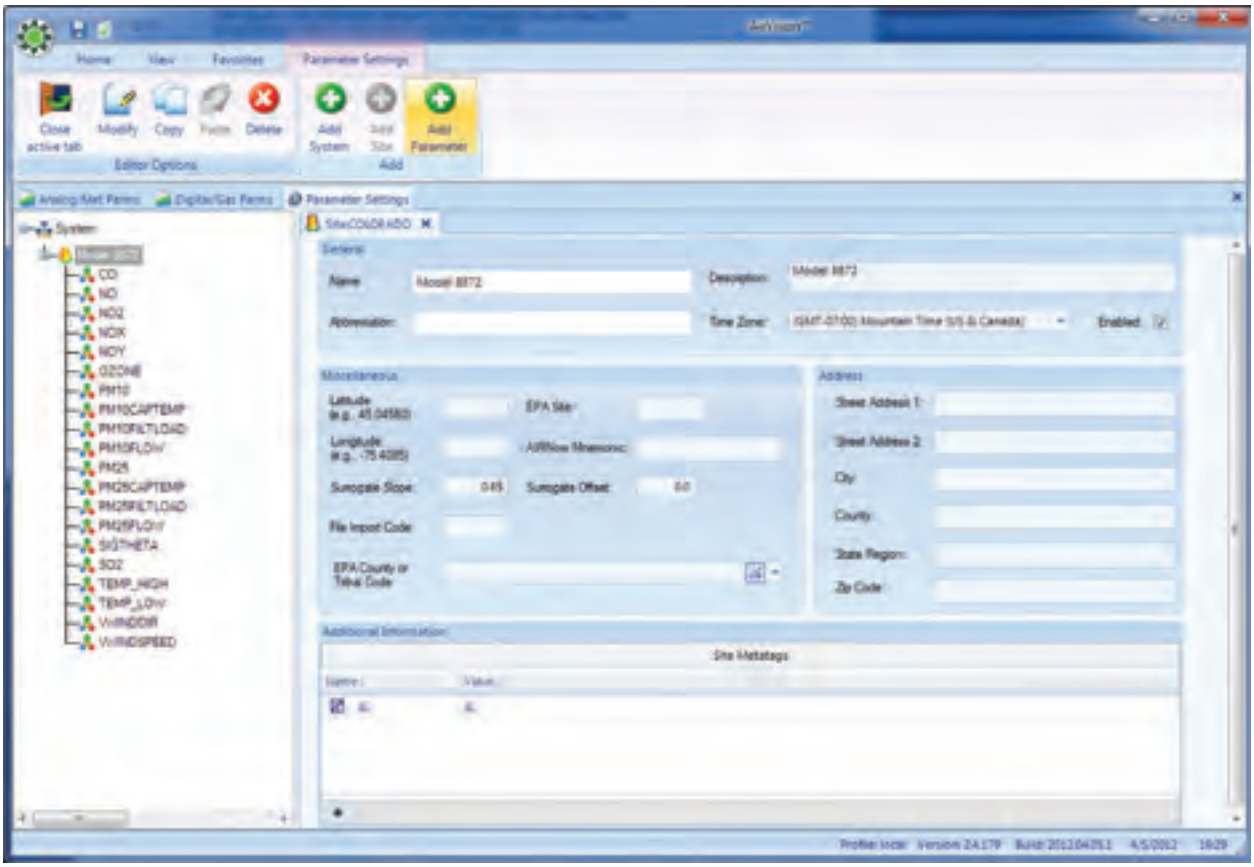
Adding a Site

To add a site (if it is not already automatically added or to modify the default site settings), single-click **Configuration Editors/Parameter Settings**. In the **Parameter Settings** screen, highlight your **System** in the tree diagram and click the **Add Site button.** Required fields are **Name** and **Time Zone**. Enter the name of your **Site** and select a **Time Zone** from the drop-down list. Select the **Enabled** box and click the **Save** icon.

To edit a site, double-click the **Site** name in the Parameter Settings tree diagram, make changes, and click the **Save** icon.



Site Configuration from Parameter Settings in Configuration Editors



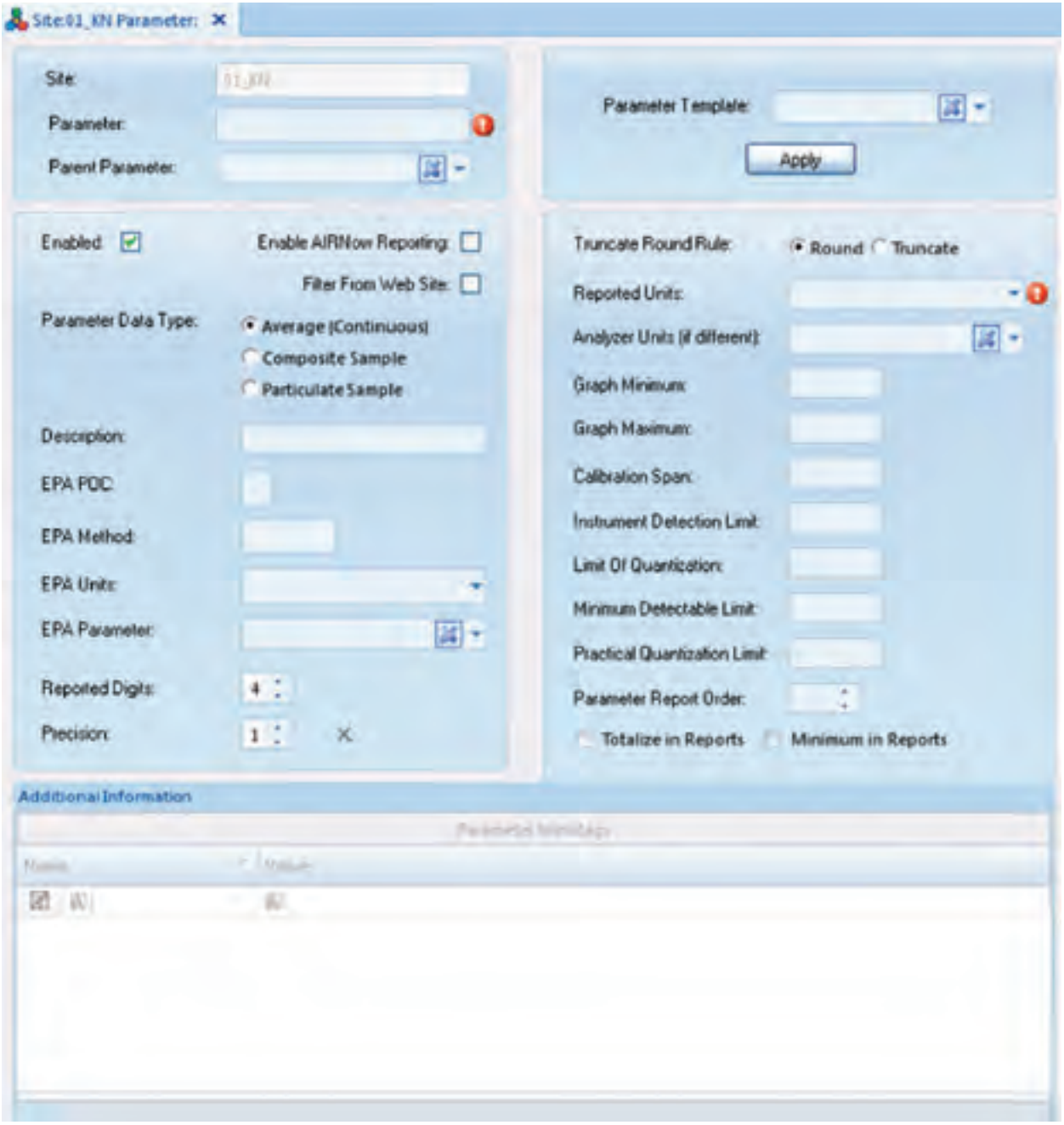
The Site Editor contains the following fields for information about the site:

- **Name (Required)** — Alphanumeric characters to refer to the site, e.g., NKnox
- **Description** — Brief description of the site, e.g., North Knoxville (optional)
- **Abbreviation** — This field is used for special formats only. (File Import is not available in the Model 8872.)
- **Time Zone (Required)** — Select from drop-down list.
- **Enabled (Required for polling)** — Check the box to enable the site. If this box is not selected the site will not be polled or appear in report/editor selections.

- **Latitude** — To comply with EPA standards, enter latitude in decimal format. For example, 75 degrees, 15 minutes, and 0 seconds would be entered as 75.250000. Enter up to 2 places and a minus sign if needed to the left of the decimal and up to 6 places to the right of the decimal.
- **Longitude** — To comply with EPA standards, enter longitude in decimal format. For example, 75 degrees, 15 minutes, and 0 seconds would be entered as 75.250000. Enter up to 2 places and a minus sign if needed to the left of the decimal and up to 6 places to the right of the decimal
- **EPA Site** — Two-character site code provided by EPA
- **AIRNow Mnemonic** — Optional reference for internal use only--not used by EPA
- **Surrogate Slope** — Used to calculate a projected (forward rolling) eight-hour average for ozone if needed, computed with the slope/intercept formula required by EPA
- **Surrogate Offset** — Used to calculate a projected (forward rolling) eight hour average for ozone if needed, computed with the slope/intercept formula required by EPA
- **File Import Code** — Single character used for file import templates in special cases only. (File Import is not available in the 8872.)
- **EPA County or Tribal Code** — County or Tribal code provided by EPA
- **Address** — Physical address of the Site
- **Additional Information** — You can add notes at the bottom of the Site Editor by clicking on the asterisk at the bottom of the screen. Enter a **Name**, for example “Distance to tree line,” and a **Value**, for example “70 feet.” When you have completed your entry press the **Enter** key on your computer keyboard. Your entry will be moved to the next row in the Additional Information section.

Adding Parameters

To add a parameter configuration, highlight a **Site** from the **Parameter Settings** tree diagram and click the **Add Parameter** button near the top of the 8872 screen. To edit a parameter select a **Site** and then double-click a **Parameter**.



Parameter Configuration from Parameter Settings in Configuration Editors

The **Parameter** screen displays the following fields. Some of the EPA Code fields are used only if your license supports full Ambient Reporting.

- **Site** — The Site you selected in the Parameter Settings tree diagram will automatically be displayed.
- **Parameter** — Alphanumeric characters to identify the Parameter
- **Parent Parameter** — A Parent Parameter can be designated to form relationships that can be used for drill-down in the Data Editor. For example, a primary analyzer pollutant such as NOx could be a parent and designated diagnostic parameters such as sample flow or box temperature could be children. Another example would be to assign particulate parameters as parents and metals for XRF (X-ray fluorescence) analysis as children. If the parameter has a parent parameter, select it from the drop-down list.
- **Parameter Template** — Parameter information can be filled in automatically by selecting a Parameter Template, which will set up EPA codes and units. Basic Parameter Templates are provided in the 8872. If you want to automatically fill in parameter information using a template, select a parameter template from the drop-down list and click **Apply**. If you have converted your data from E-DAS and the information is already filled in, you can still select a template but if you click Apply or it will be overwritten.
- **Enabled** — Check the box to enable the parameter.
- **Enable AIRNow Reporting** — Not used in the Model 8872
- **Filter from Web Site** — Check the box to filter data from website
- **Parameter Data Type** — Select a data type: **Average (Continuous)**, **Composite Sample**, or **Particulate Sample** (for manually entered, non-continuous data).
- **Description** — Enter a brief description of the parameter (optional).
- **EPA POC** — Enter an EPA Parameter Occurrence Code if needed. POC is used for different monitors measuring the same parameter at one site.

◆ EPA Method	EPA sampling Method Code
◆ EPA Units	Select EPA Units (including the EPA unit code) from the drop-down list (e.g., 007-parts per million, 015-degrees Fahrenheit).
◆ EPA Parameter	Select a parameter (including EPA parameter codes) from the drop-down list (e.g., 44201 - Ozone).
◆ Reported Digits	Total number of digits, including decimal places, that will be reported to the EPA.
◆ Precision	Number of decimal places for reporting precision.X's and Y's to the right of the reporting precision field illustrate the format of the digits/precision, e.g., XX.YY indicates a total of four Reported Digits with a Reporting Precision of two.
◆ Truncate/Round Rule	Determines whether data in reports will be rounded or truncated
◆ Reported Units	Units that will be used for reports e.g., PPM
◆ Analyzer Units	If the analyzer units are different from the primary parameter, select analyzer units from the drop-down list.
◆ Graph Minimum	Lower y-axis limit for graph display
◆ Graph Maximum	Upper y-axis limit to for graph display
◆ Calibration Span	This field is determined by the instrument. Enter the configured calibration span value for the parameter to determine the parameter's calibration error (at the data logger).
◆ Instrument Detection Limit (DL)	Not used in 8872.
◆ Limit of Quantization (LOQ)	Not used in 8872.
◆ Minimum Detectable Limit (MDL)	Not used in 8872.
◆ Practical Quantization Limit (PQL)	Not used in 8872.

- **Parameter Report Order** — Parameters in reports are printed in the same order that they are shown under each site. Select Parameter Report Order to change the order parameters appear in reports. Report Order only applies to Daily Summary and Monthly Reports.

- **Totalize in Reports** — If this option is selected, Monthly Reports will show a total of data rather than an average. Totalize in Reports is most commonly used for rainfall.

- **Minimum in Reports** — If this option is selected, Monthly Reports will show a minimum of data rather than a Maximum. Minimum in Reports is most commonly used for temperature.

- **Additional Information** — You can add notes at the bottom of the Parameter Editor by clicking on the asterisk at the bottom of the screen. Enter a **Name**, for example "Data Last Certified," and a **Value**, for example "9/1/2008." To add another row when you have completed your entry, press the **Tab** key on your computer keyboard. A blank row will be displayed.

Adding Loggers to Sites in Logger Channels

The next step, after configuring sites and parameters, is to add **Loggers** to sites (if it has not already been added automatically. The 8872 can also poll 8816/8832 data loggers, BAMs, TEOMs, etc., if desired. Normally the 8872 will only have one logger represented (itself), and this is generally automatically configured with a shipped logger.

Data loggers must be added to sites **BEFORE** channels are configured. Channels are added to loggers after the loggers are set up.

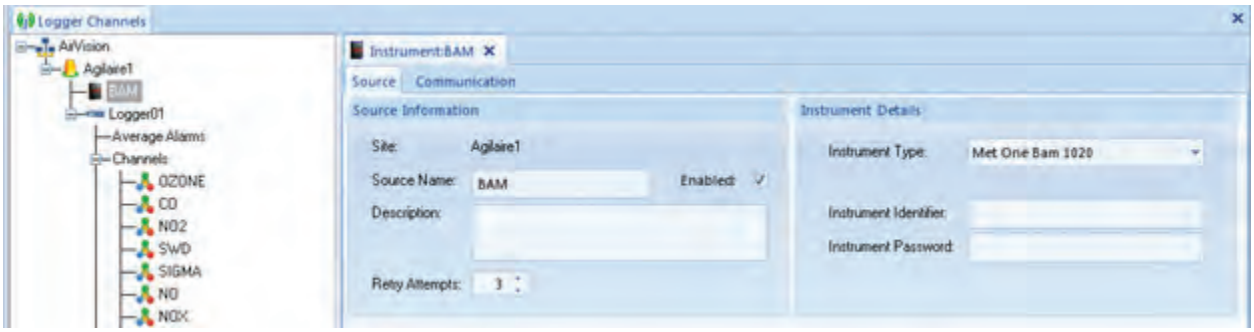
Still in the **Configuration Editor**,

- single-click **Logger Channels**,
- highlight a **Site**,
- click the **Add** button and
- select **Logger**.
- enter a **Source Name**, e.g., 01Logger,
- enter the **Logger ID** e.g., 01 (This field is required),
- select a **Logger Type** from the drop down list, e.g., 8872,
- and click **Enabled**.
- optionally, you can enter a **Description** and select **Debounce Digital Inputs**.
- Click the **Save** button.

Logger Configuration from Logger Channels in Configuration Editors

Adding an Instrument

If the 8872 is licensed to poll and instrument directly, select **Configuration Editors/Logger Channels** and highlight the **site name** in the **Logger Channels** configuration tree diagram. Click the **Add button** and select **Instrument**. The **Instrument Type** (ID) field is required and can be selected from the drop-down list. Enter a **Source Name**, an **Instrument Identifier** and **Instrument Password** , and click the **Enabled** box. Click the **Save** icon.



Instrument Configuration from Logger Channels in Configuration Editors

Adding/Modifying Channels

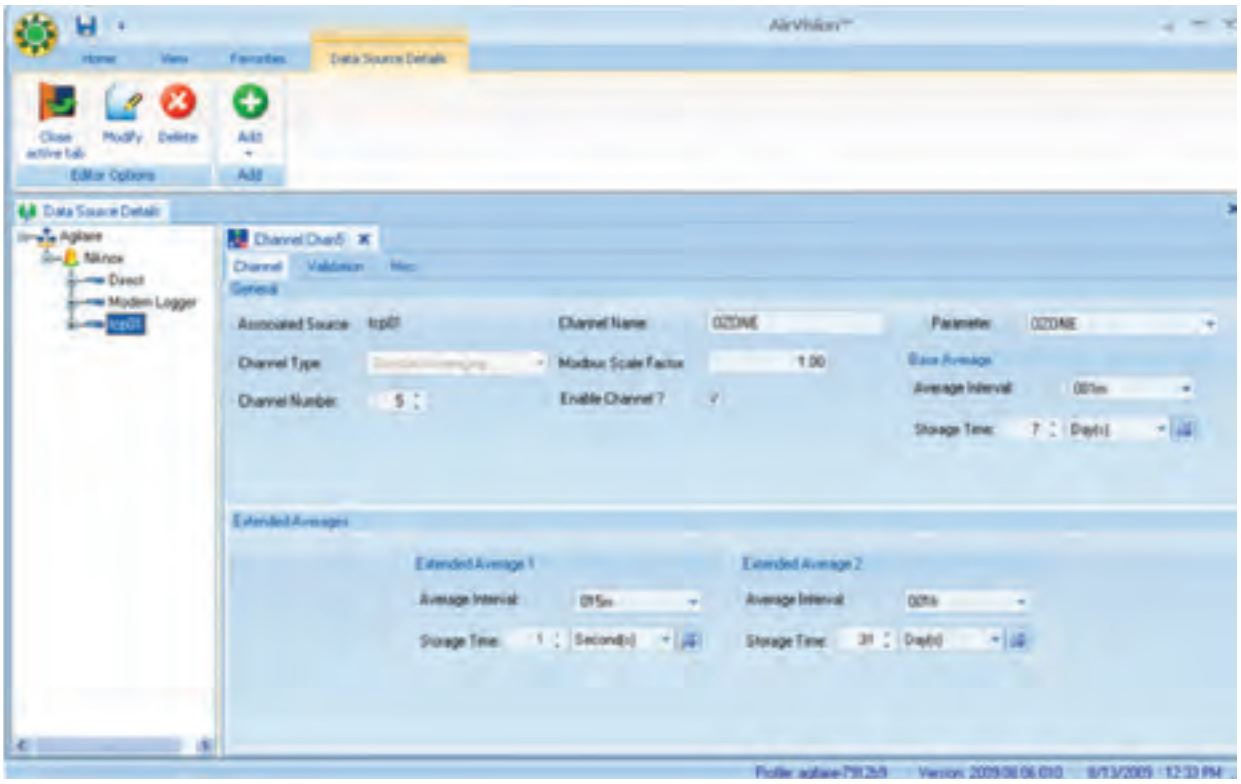
Still in the **Configuration Editor**, **Logger Channels**,

- select a **Logger** that has already been added to a **Site**
- click the **Add** button.
- select **Add Channels**,
- select a **Channel Type**, e.g., Standard Averaging, GSI, VWS, etc. For details on how these different channel types work and their settings, consult Appendix A.
- select a **Channel Number** (a channel number will automatically be added in order but it can be changed)
- select a **Parameter.** When you select a parameter, the Channel Name will automatically be changed to match the Parameter name.

For the remainder of the prompts on the form, consult the 8872 User Manual.

- select an **Average Interval** and **Storage** for the **Base Average**, **Extended Average 1**, and **Extended Average 2**.
- Click the **Save** button

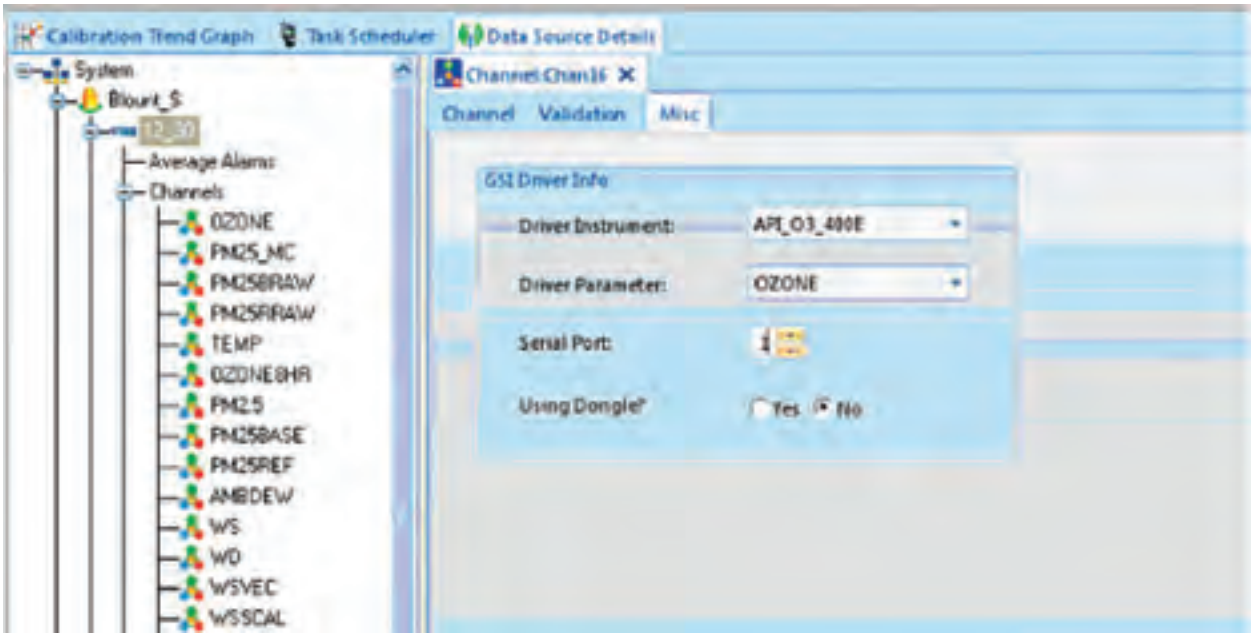
Follow the same procedure to add calibrations, average alarms, and digital event triggers.



Adding channels to loggers in the Data Source Configuration from Configuration Editors

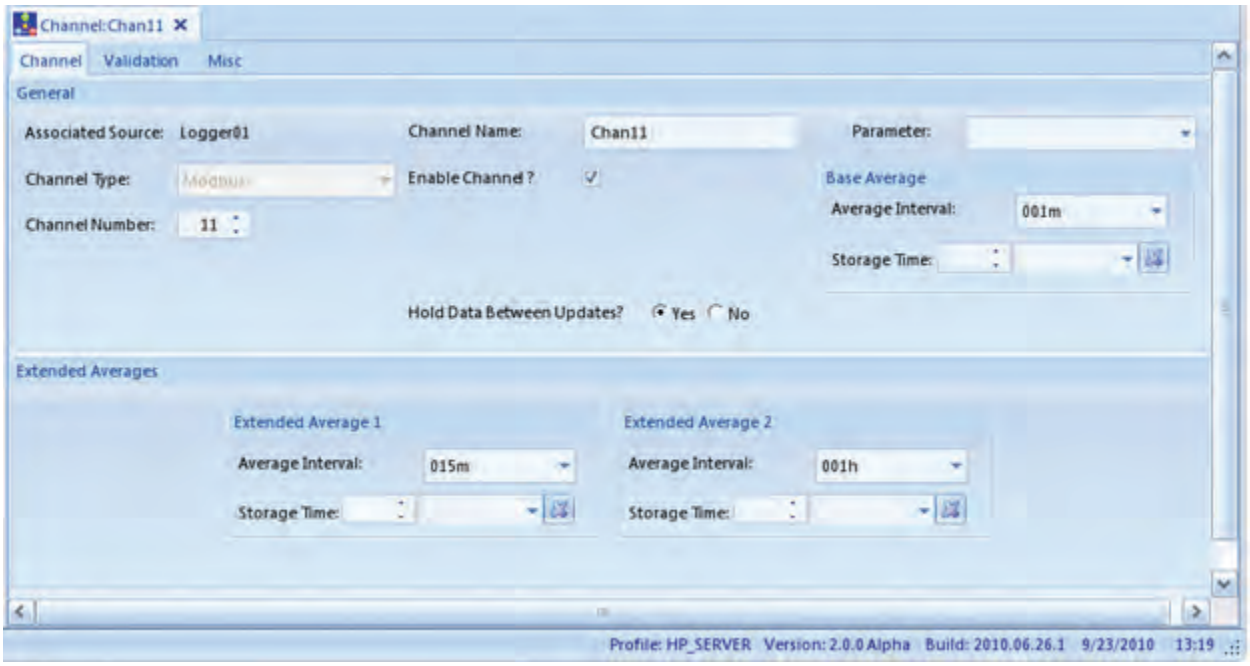
Two channel types are handled differently in the 8872 than in previous systems; both improve on digital data acquisition integration.

- The first channel type, the GSI (Generic Serial Interface) channel, is used for RS-232 based instruments. The 8872 includes GSI drivers for a wide variety of instruments. Choose the instrument, the parameter, and designate which serial port is connected. The "Use Dongle" setting is not used.



GSI channel configuration

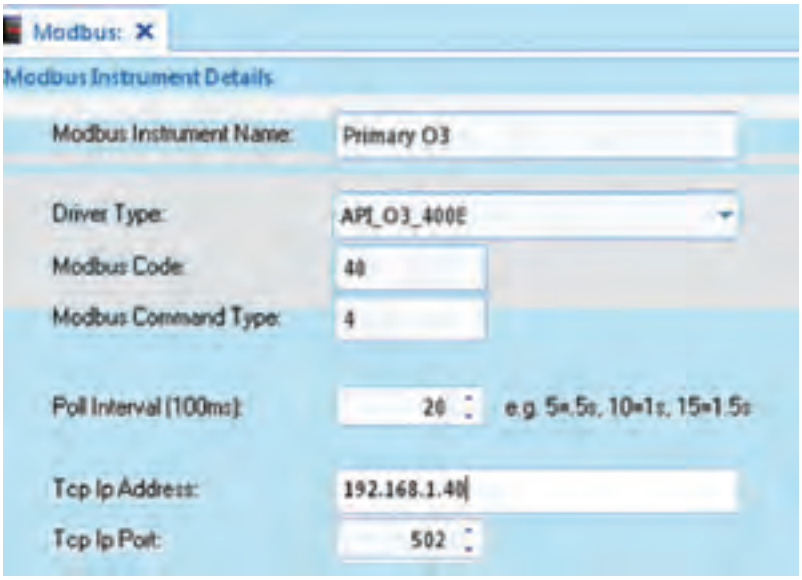
- The second channel type (a better approach for digital data acquisition) is the Modbus channel. Designate an **Instrument** that has been previously configured in the **Logger Channels** editor, and select a **Parameter**.



Modbus channel configuration

Modbus instruments have additional networking information that needs to be known, you must create an instance of the Modbus instrument in the Logger Channels editor before creating the Modbus channels for that instrument (This procedure prevents the need to repeat entry of the networking information for each channel).

To create the instrument, go to the Logger Channels editor, select the data logger in the tree diagram, and select **Add** > **Logger Modbus Instrument**.



Modbus Instrument Details in Logger Channels

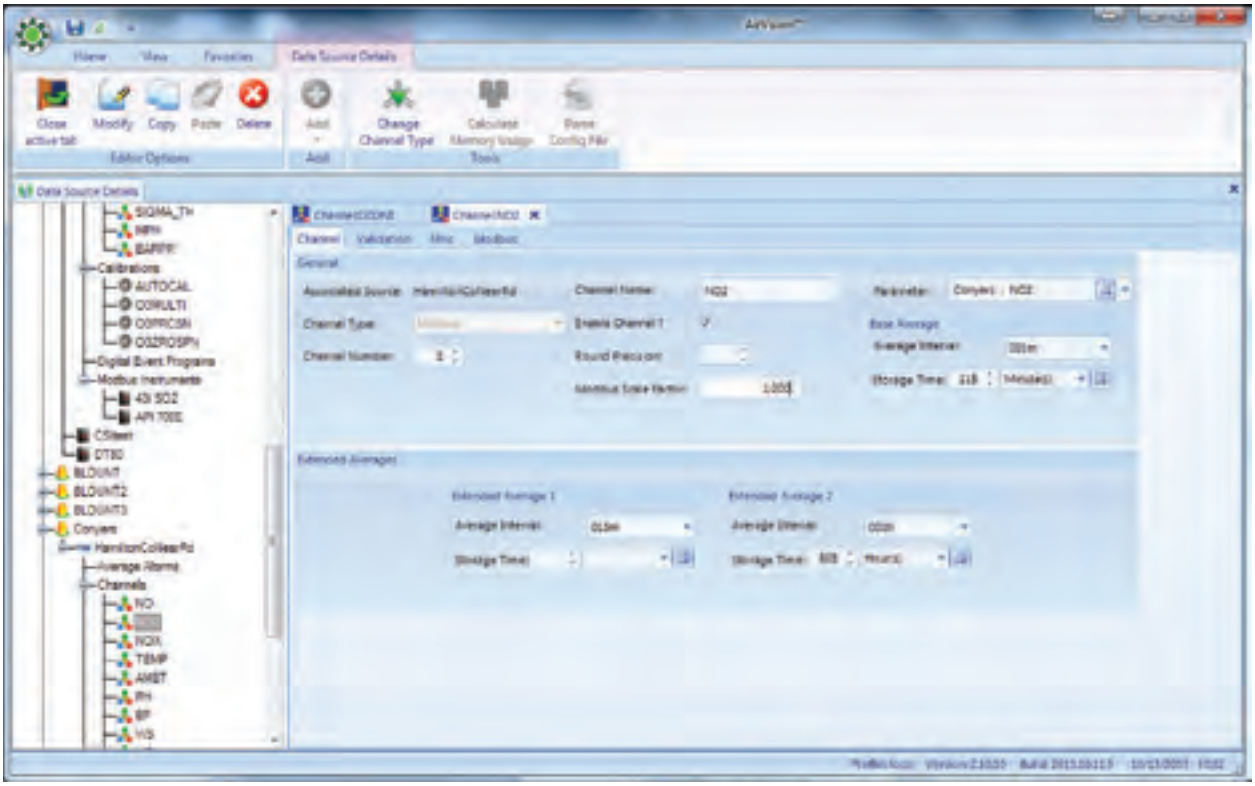
Enter the following fields:

- **Instrument Name**--a user-defined label for the instrument
- **Driver Type**--select from picklist of known analyzers
- **Modbus Code**--also known as the **Modbus Device ID**, this ID is set in the analyzer, and is some value from 1-255
- **Modbus Command Type**--defines which Modbus command is used to read data from the analyzer (3 for TECO, 4 for API, consult instrument documentation for other brands)
- **Poll Interval**- how often data should be requested from the instrument, in tenth of a second increments. Generally, a rate of 20-30 seconds is recommended.
- **TCP Address**--IP address of the instrument, as viewed from the logger's perspective
- **TCP Port**--Port used by the instrument for Modbus requests, usually "502".
- **Timeout (MS)**--Designates the time the logger will wait on an instrument for a Modbus response. Typical values are 250-750 MS

Once the instrument is configured and saved, you can then select **Add**> **Add Channe**l > **Modbus** in the **Logger Channels** editor. Under the **Misc** tab, select the **Modbus Instrument** and **Driver** from the picklists. If you need a parameter that is not in the picklist, contact Agilaire Support (support@agilairecorp.com) and we will add it to your system.

Misc tab in Add Modbus

Modbus channels in the 8872 will use the **Modbus Scaling Factor** to convert floating point data from the instrument before using it in averages, calibrations, etc. This can be used to convert an analyzer that only provides PPB data on the Modbus link to PPM data, or similar conversions. This approach is preferred over **Analyzer Units** in the logger, since the **Analyzer Units** conversion only takes place on averages and calibration data, but causes inconsistency with other logger configuration settings (alarm limits, calibration expected values, etc).



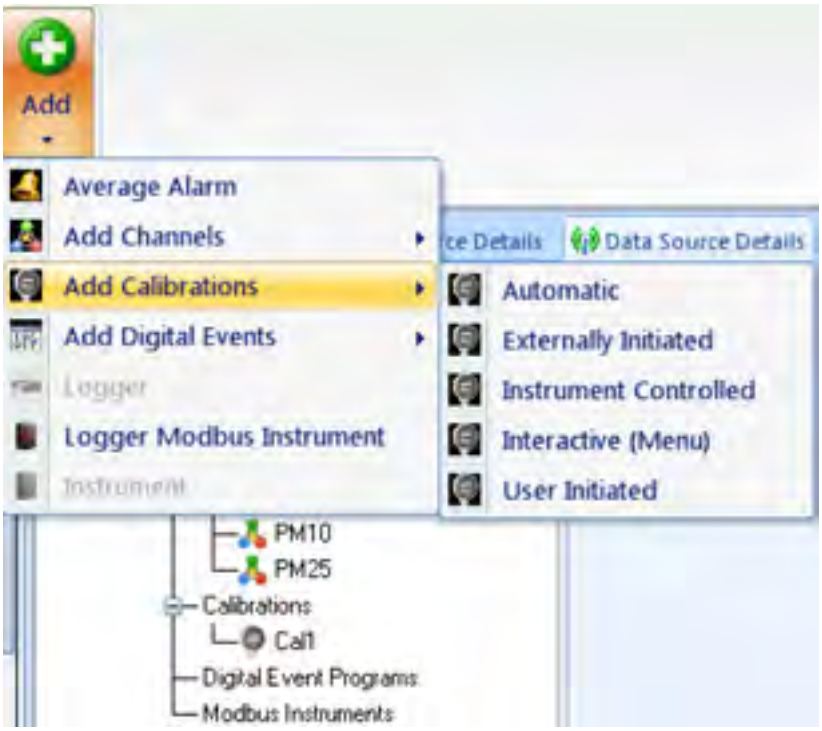
Special Case- External Channels

The Model 8872 supports a new channel type "E" for External Channels. These allow the user to create a 'fake' channel associated with parameter from a directly polled instrument (e.g., BAM, E-Sampler, etc), where the logger is not doing real-time acquisition (e.g., directly polled instruments in an 8872). It exists ONLY to create a channel number for use with logger polling. The External type channel requires no other special configuration, and is ignored by the Site Node Logger process.

Setting Up Calibrations

To configure calibrations:

- open **Configuration Editors** > **Logger Channels**
- highlight the **Logger** in the tree diagram
- click the small arrow under the **Add** button
- select **Calibrations** from the drop-down list
- select one of the following calibration types:
  Automatic
  Externally Initiated
  Instrument Controlled
  Interactive (Menu)
  User Initiated



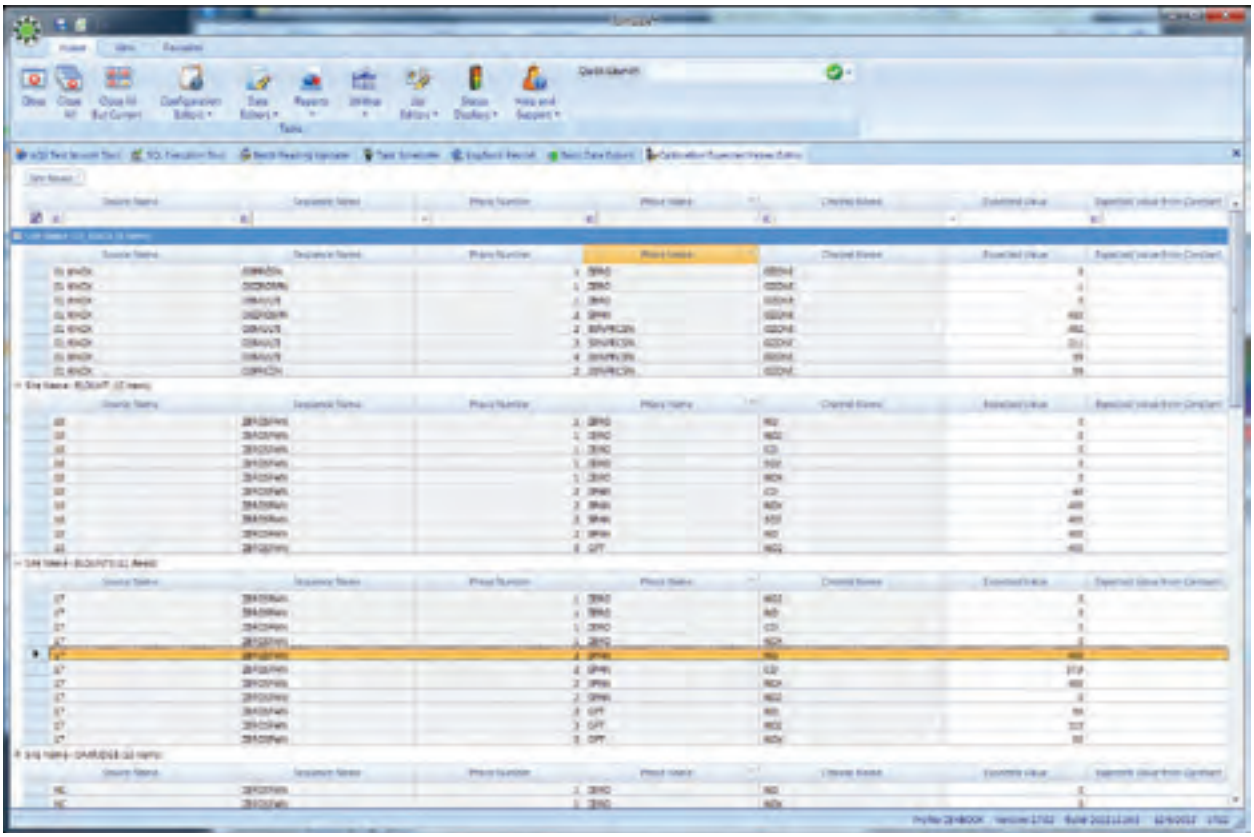
Adding calibrations in Configuration Editors > Logger Channels

For details about calibration types and the particulars of the settings, consult Appendix A.

▶ **Note:** Configuration information must be downloaded to the data logger before a new sequence can be initiated.

Calibration Expected Values Editor

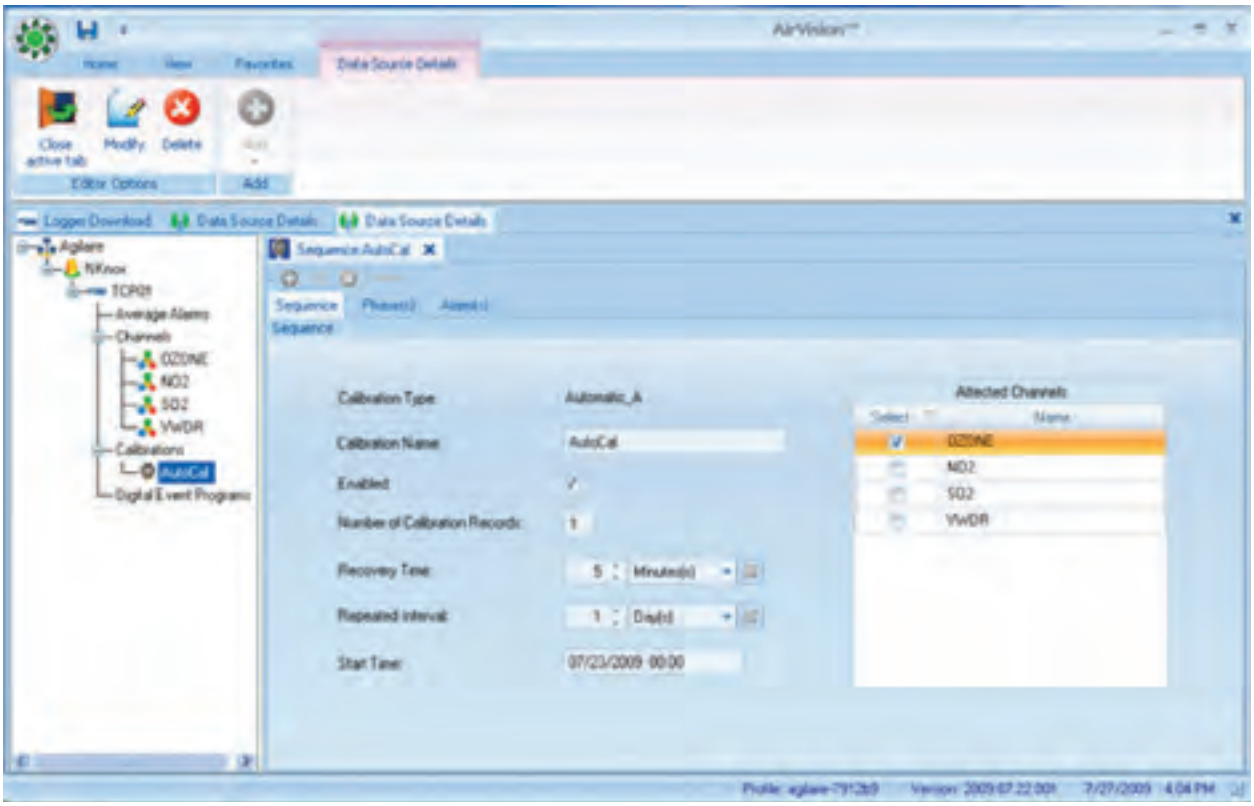
This mimics the “Quick Expected Values” editor in the Model 8832 data logger that allows the user to quickly update target values for the calibration without sorting through the Calibration configuration editor. The system shows all configured calibrations as expandable/collapsible boxes. Once opened, columns headers can be clicked to sort by phase name, expected value, etc. for easier data entry.



Configuring Automatic Calibrations

If you configure **Automatic** Calibrations, the cal you enable will be automatically initiated by the data logger's internal clock. The Automatic Cal Sequence configuration screen has the following fields :

- **Calibration Type** will be already filled in (Automatic_A).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases.
- **Repeated Interval** determines how often cal sequence will repeat.
- **Start Time** determines what time cal sequence will start.
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.

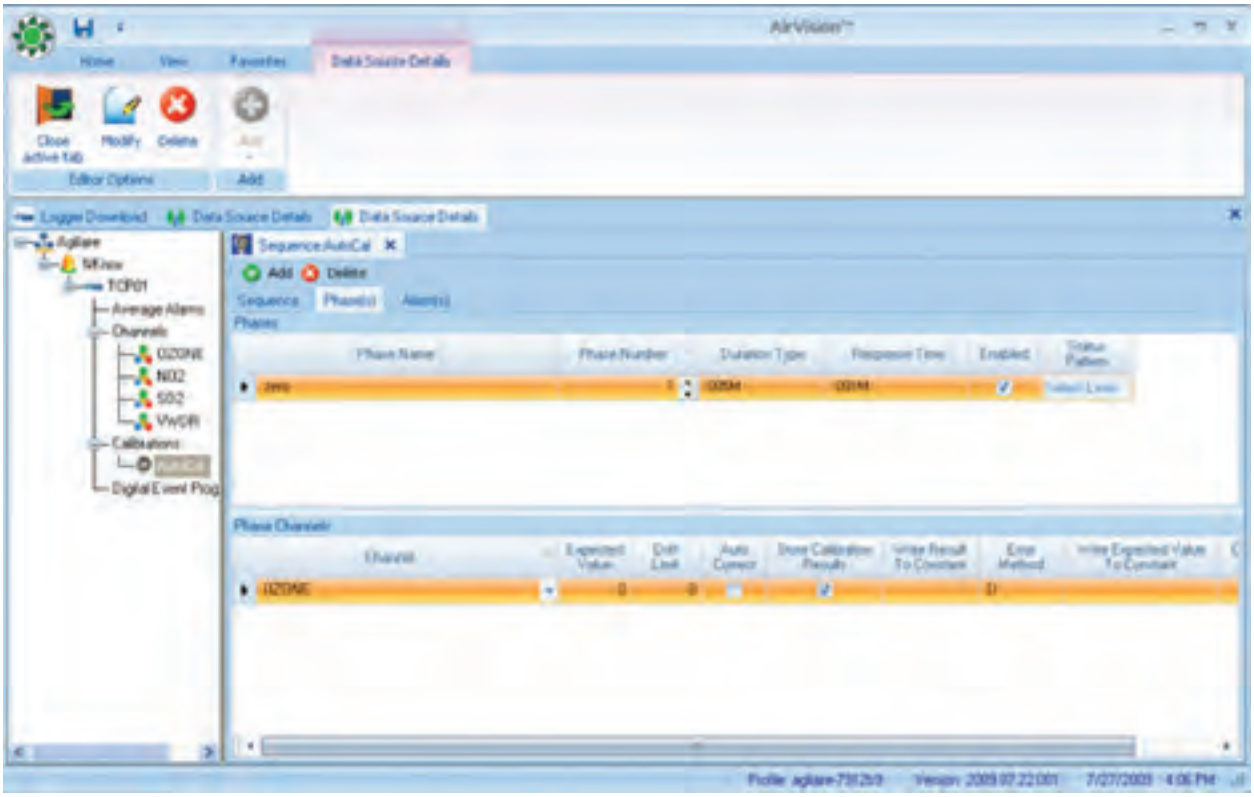


Automatic Calibration configuration in Configuration Editors > Logger Channels

Configuring Phases

To set up Phases:

- click the **Phase(s)** tab behind the Sequence Cal tab.
- To enter a phase name, click the click the **Add** (above the tabs) and select **Phase** from the drop-down list.
- Enter a **Phase Name**, **Phase Number**, **Duration Type**, **Response Time**, and click to check the box in the **Enabled** column.
- To configure a **Status Pattern**, click in the **Status Pattern** column and a check list of **Output Control Patterns** will come up.
- After the Phase table is configured, click **Add** again and select **Phase Channels**.
- Select a **Channel** from a drop-down list, and optionally enter an **Expected Value**, **Expected Value from Constant**, **Warning Drift Limit**, **EV for Auto Correct** (click to enable), **Store Cal Results** (click to enable), **Write Result to Constant**, **Error Method**, **Write Expected Value to Constant**, and **Out of Control Limit**.

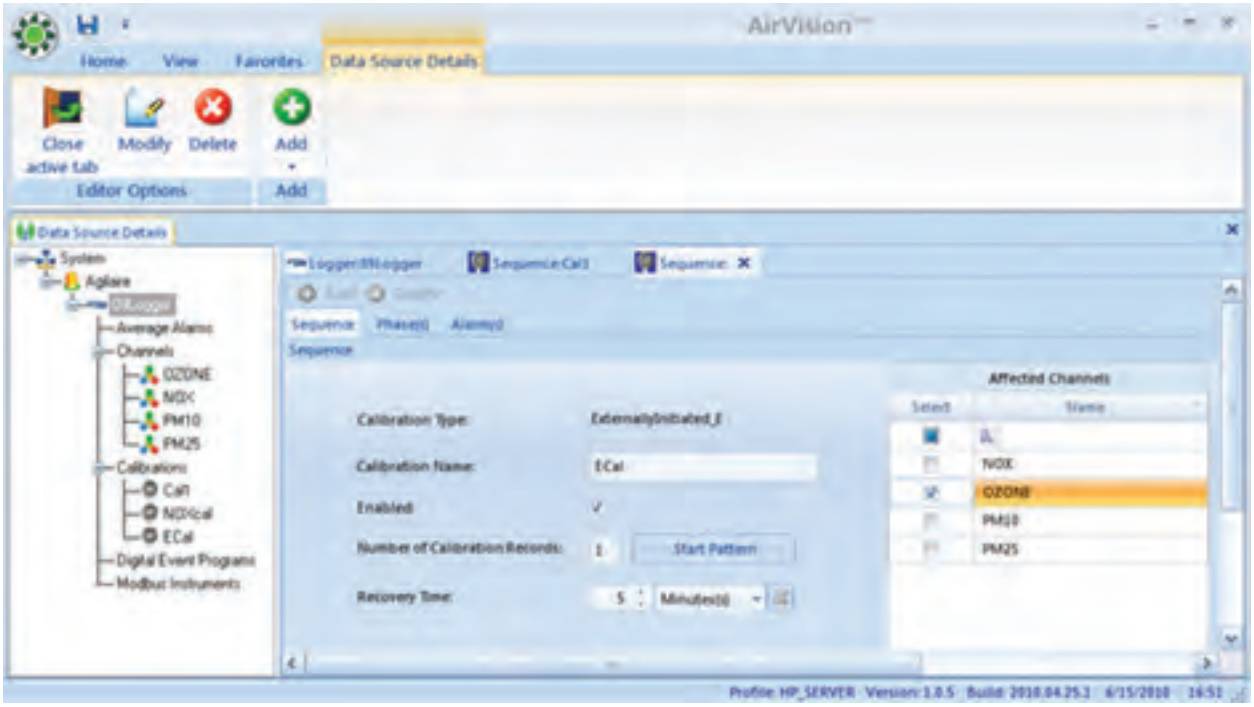


Configuring calibration phases in Configuration Editors > Logger Channels

Externally Initiated Calibration

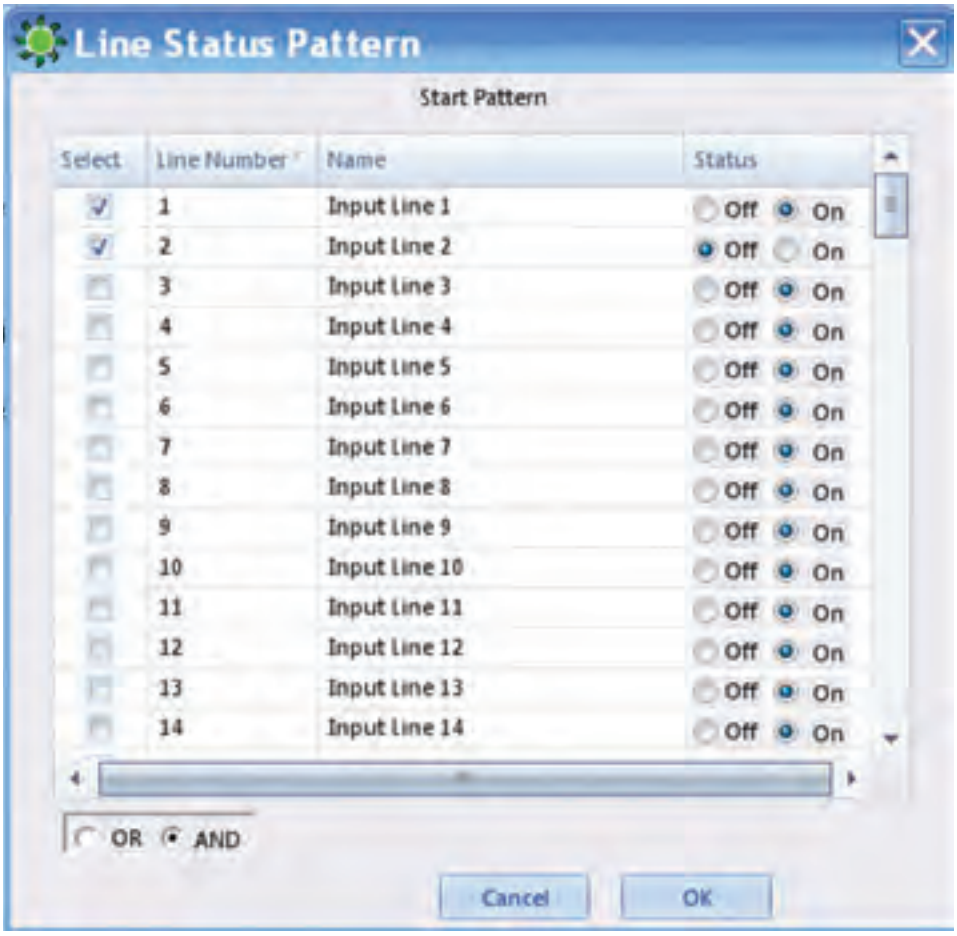
Externally initiated calibration is identical to an automatic calibration except for the way it is initiated. The sequence is started when a specified pattern of input control lines is met. To configure the **Start Pattern** (Line Status Pattern), click the **Start Pattern button**.

Individual phases are then initiated sequentially. As with an automatic calibration, the duration of each phase in the sequence can be specified.



Configuring Externally Initiated Calibrations in Configuration Editors > Logger Channels

When you click the **Start Patter**n button in the **Externally Initiation Calibration** screen, you **will see a Line Status Pattern** screen. Check the **Select** box to select an **Input Line** and select a **Status** of **On** or **Off**.The Externally Initiated Cal will begin when the **Start Pattern** is met.

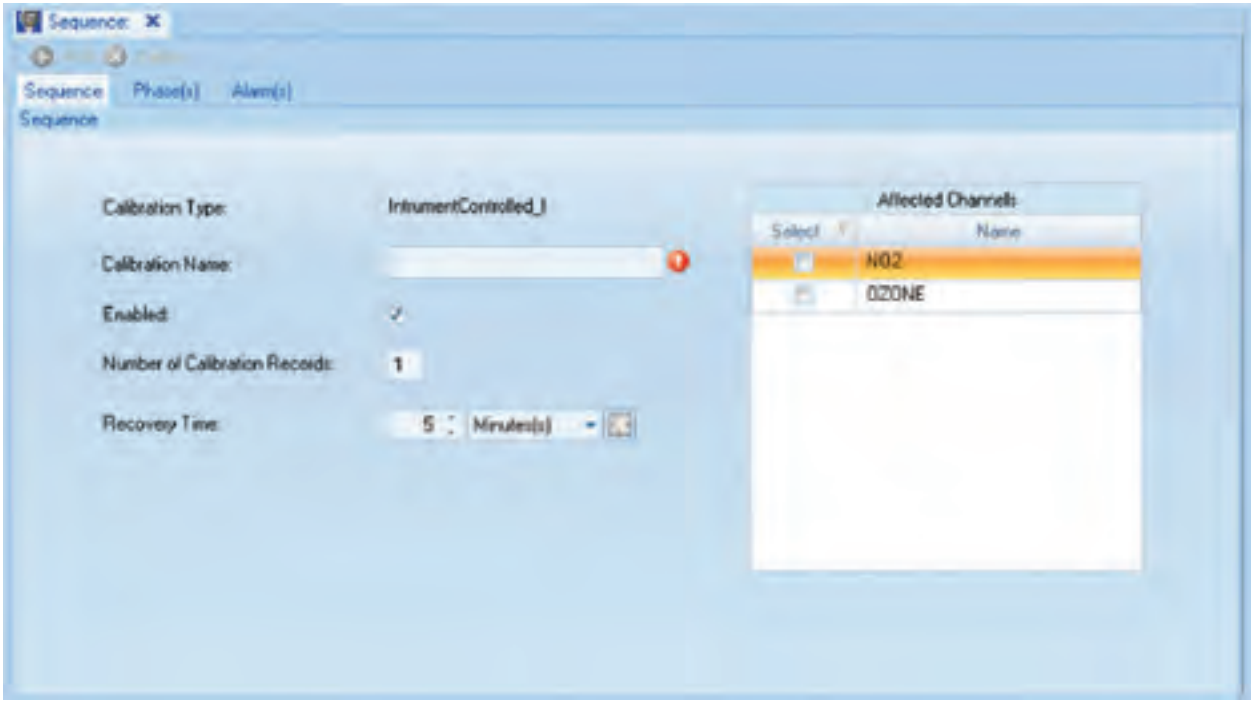

Line Status Pattern
Start Pattern
Select
Line Number
Name
Status
1 Input Line 1 Off On
2 Input Line 2 Off On
3 Input Line 3 Off On
4 Input Line 4 Off On
5 Input Line 5 Off On
6 Input Line 6 Off On
7 Input Line 7 Off On
8 Input Line 8 Off On
9 Input Line 9 Off On
10 Input Line 10 Off On
11 Input Line 11 Off On
12 Input Line 12 Off On
13 Input Line 13 Off On
14 Input Line 14 Off On
OR AND
Cancel
OK

Configuring Start Pattern (Line Status Pattern) in Externally Initiated Calibrations in Configuration Editors > Logger Channels

Configuring Instrument Controlled Calibrations

If you configure **Instrument Controlled** Calibrations, enabled calibrations will be initiated by the data logger when it detects a specified digital input pattern. Each phase will continue until the input line pattern changes. The Instrument Controlled Cal screen has the following fields:

- **Calibration Type** will be already filled in (InstrumentControlled_I).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.



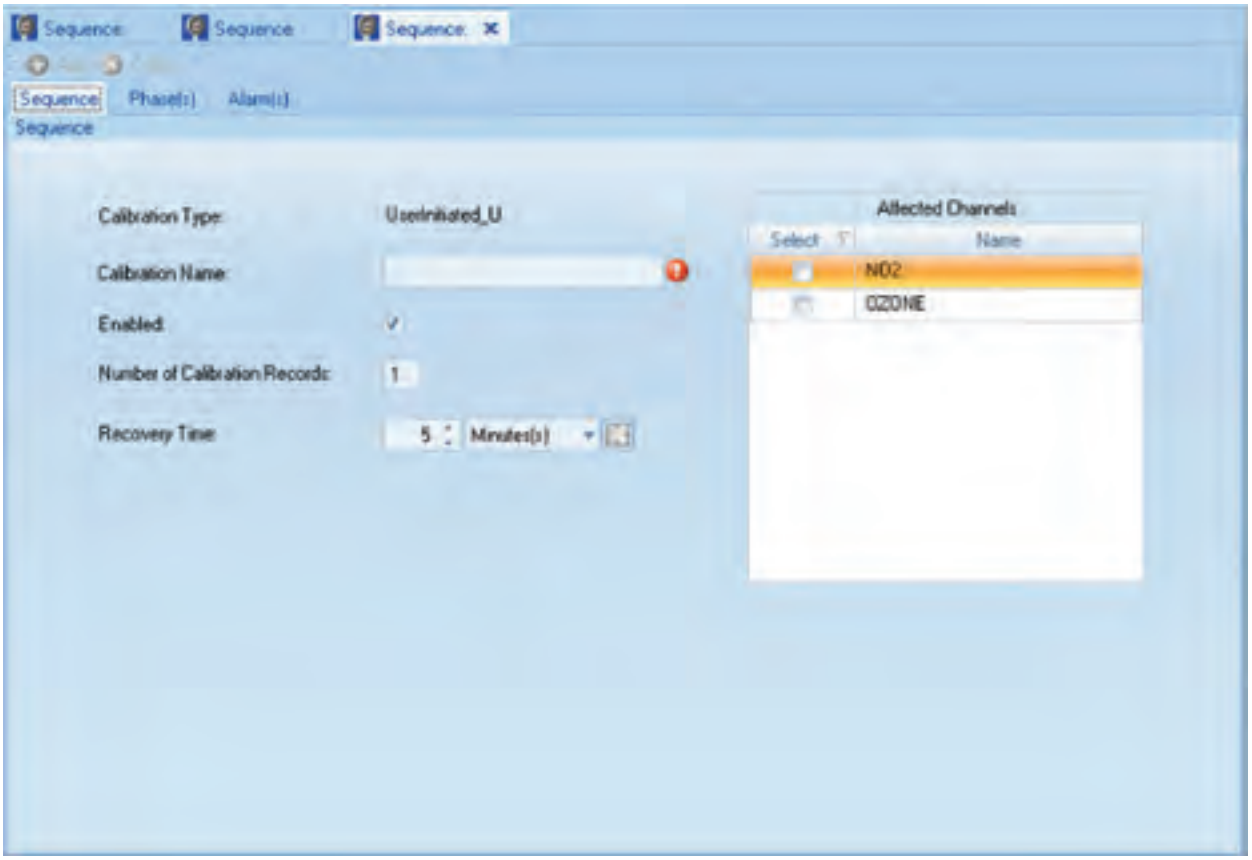
Configuring Instrument Controlled Calibrations from Configuration Editors > Logger Channels

Configuring User-Initiated Calibrations

User-initiated calibrations are started manually by linking to the data logger. When the cal sequence is started, each phase will be initiated in order. The duration of each phase is configured with the same fields as automatic cals.

The User-Initiated Cal configuration screen has the following fields :

- **Calibration Type** will be already filled in (UserInitiated_U).
- **Calibration Name** is required to identify the cal program.
- Check **Enabled** if the calibration is to run.
- **Number of Calibration Records** determines how many cals the data logger will store before overwriting.
- **Recovery Time** specifies the time required to purge cal gas after phases.
- **Affected Channels** determines which channels will be taken off-line during cal. Select from a list of previously configured parameters.



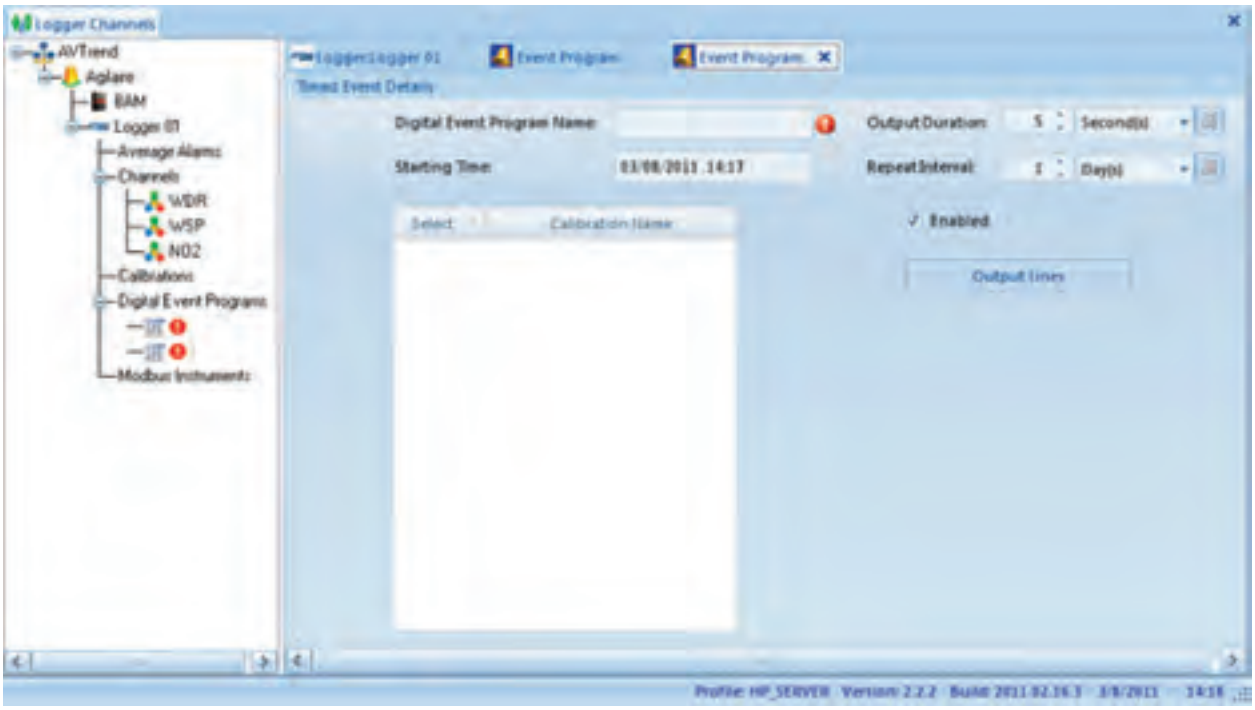
Configuring User-Initiated Calibrations

Configuring Input/Output Lines for Digital Events

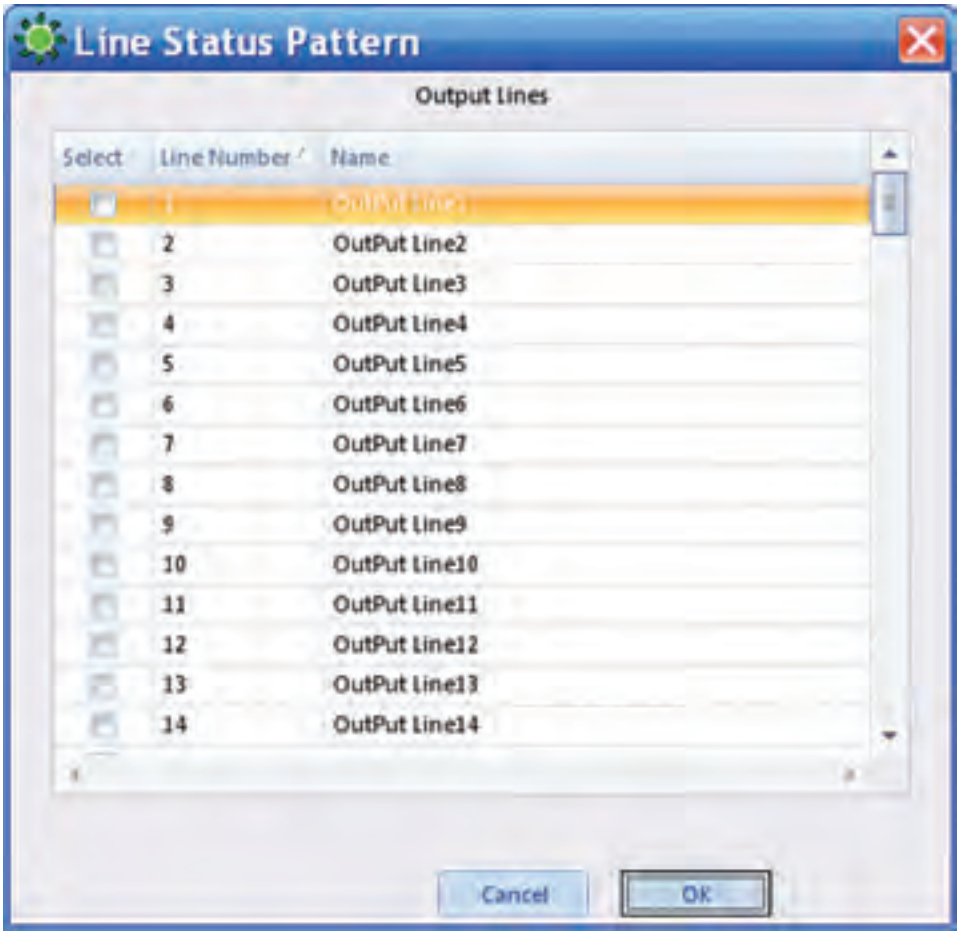
The purpose of digital event programs is to control processes via relay outputs on the Model 8872. **Digitally Timed Events** will turn on specified **Output Lines** for the configured **Starting Time**, **Duration**, and **Repeat Interval**. **Digitally Triggered Events** are initiated by a digital input pattern that will turn on one or more digital output lines. The output lines will remain active for the specified duration; at the end of this time, the output lines will be turned off unless the triggering digital input pattern still matches.

Configuring Digital Timed Events

1. Highlight the **Data Logger** in **Configuration Editors > Logger Channels** tree menu.
2. Click the green **Add** button in the ribbon and select **Add Digital Events > Timed Event**.
3. Enter a **Digital Event Program Name**, a **Starting Time**, **Output Durations**, **Repeat Interval**, and check **Enabled**.
4. If the Digitally Timed Even is for a calibration, select a **Calibration Name** from the drop-down list.
5. Click the **Output Lines** button to bring up the **Line Status Pattern** screen and select a **Line Number**. Click **OK**.



Configuring Digitally Timed Events



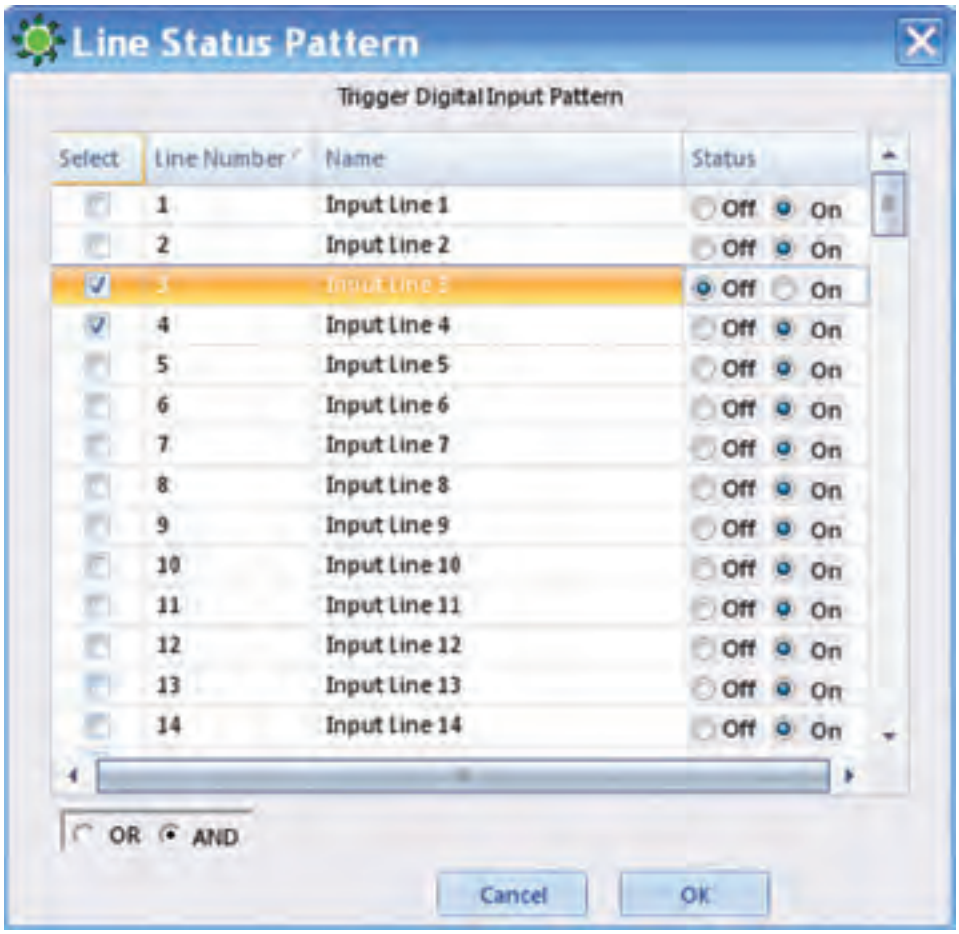
Line Status Pattern for Output Lines

Configuring Digital Triggered Events

1. Highlight the **Data Logger** in **Configuration Editors > Logger Channels** tree menu.
2. Click the green **Add** button in the ribbon and select **Add Digital Events > Triggered Event**..
3. Enter a Triggered **Digital Event Program Name**, an **Output Duration** and check **Enabled**. After the output duration time period, the program will check the digital input pattern to see if it still matches. If not, the output control lines will be switched off. If the pattern still matches, the output relays will remain on, and the duration time will begin again.
4. If the Digitally Triggered Event is for a calibration, select a **Calibration Name** from the drop-down list.
5. Click the **Output Lines** button to bring up the output **Line Status Pattern** screen and select which **Output Line or Lines** will be switched on when the triggered digital input pattern occurs. Click **OK**..

6. Click the **Trigger Digital Event Pattern button** to bring up the **Line Status Pattern** screen for Trigger Digital Input Pattern and select which **Input Line**.or **Lines** turned **On** or **Off** will trigger the event and switch on the specified **Output Line(s)**..

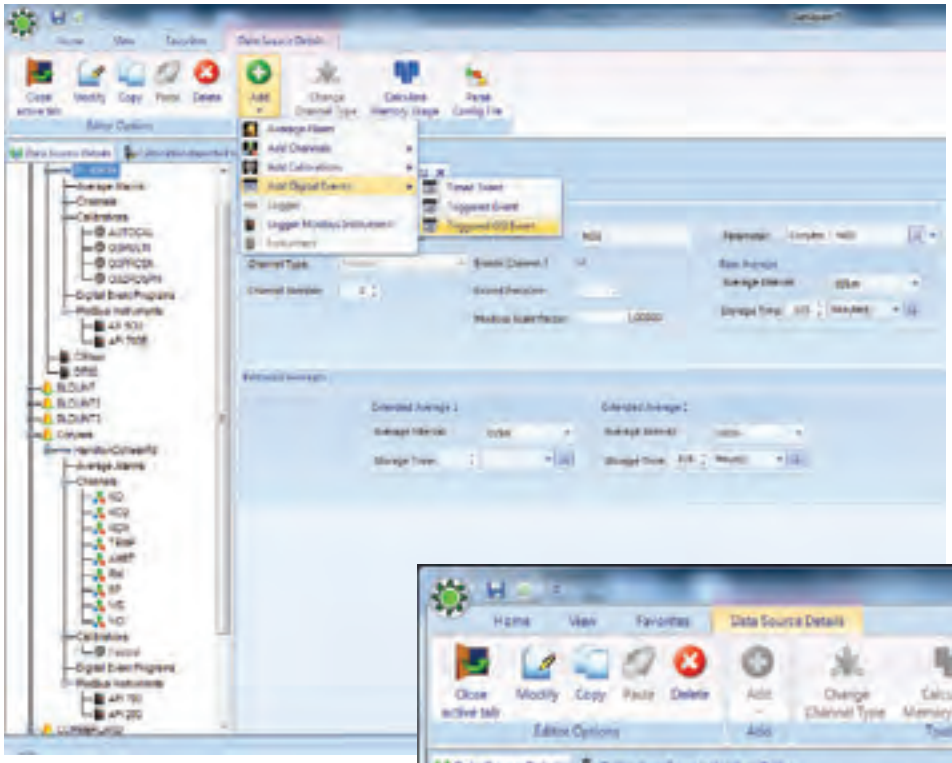
7. In the lower left corner of the screen, select **And** or **Or**. If you select **And** (the default), the digital event program will be triggered **only if ALL** the specified conditions occur. If you select **Or**, the digital event program will be triggered if **ANY** of the specified conditions occur. Click **OK**.


Line Status Pattern
Trigger Digital Input Pattern
Select
Line Number
Name
Status
1 Input Line 1 Off On
2 Input Line 2 Off On
3 Off On
4 Input Line 4 Off On
5 Input Line 5 Off On
6 Input Line 6 Off On
7 Input Line 7 Off On
8 Input Line 8 Off On
9 Input Line 9 Off On
10 Input Line 10 Off On
11 Input Line 11 Off On
12 Input Line 12 Off On
13 Input Line 13 Off On
14 Input Line 14 Off On
OR
AND
Cancel
OK

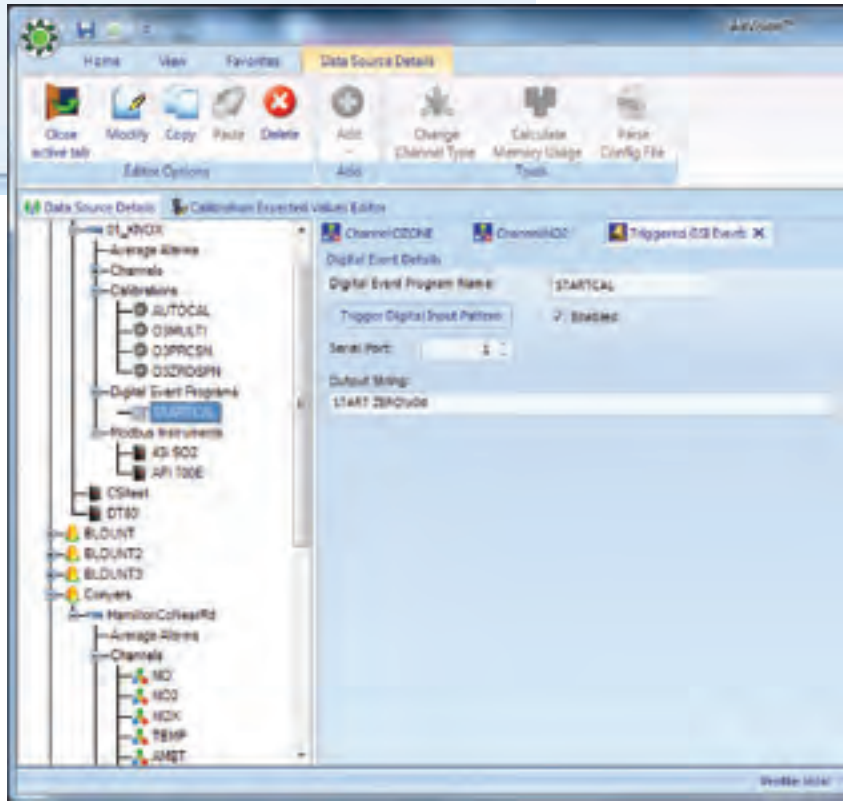
Trigger Digital Input Line Status Pattern with OR/AND selection

Configuring DI-Triggered GSI Events

These events are used to send GSI strings based on the transition of a digital input (or of a pseudo DI-DO pair in the logger). Commonly, these are used to control RS-232 based calibrators or other devices. For this device, a digital input pattern is defined. When the logger sees the digital input transition to match this pattern, the GSI string is sent out the designated serial port (just once). The string is not resent until the logger goes to a non-matching input state, and then back to the matching state.



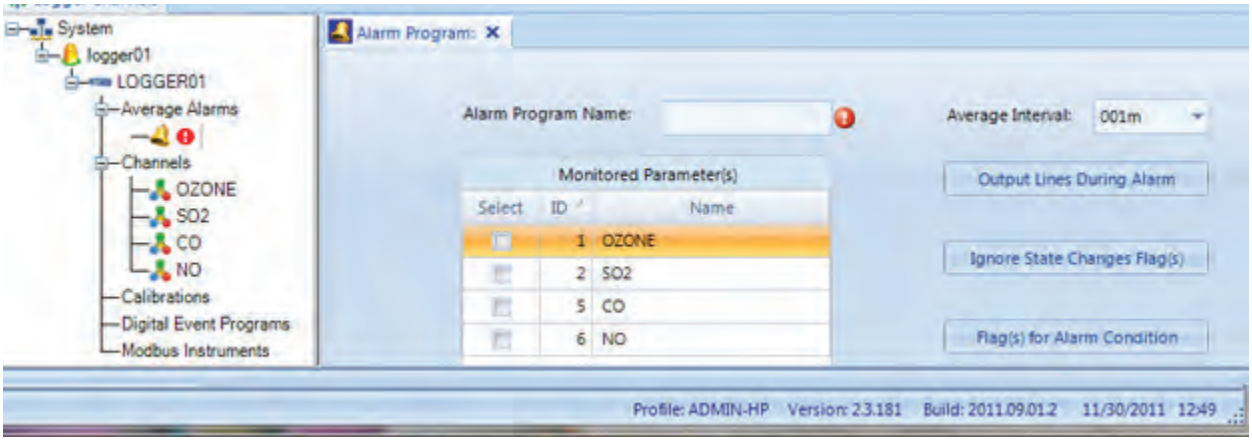
Triggered GSI Event



Digital Event details

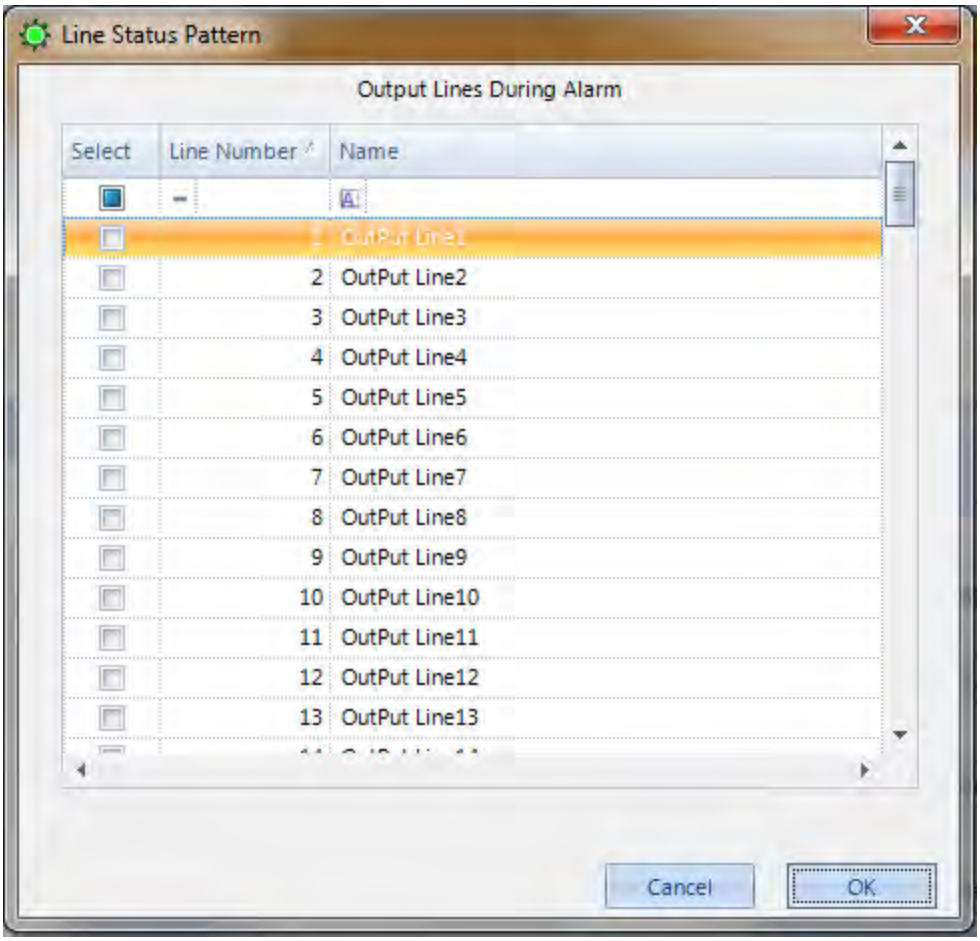
Average Alarms

Average Alarms are configured the same way as Cals and Digital Events, by selecting **Configuration Editors > Logger Channels** and highlighting the logger in the **Logger Channels tree**, then selecting **Add > Average Alarm** from the drop-down list. You will see the following screens:



Average Alarm Configuration (Configuration Editors > Add Average Alarm)

Select a **Monitored Parameter** (or Parameters), then click **Output Lines During Alarm**, **Ignore State Changes Flags**, or **Flags for Alarm Condidtion**.

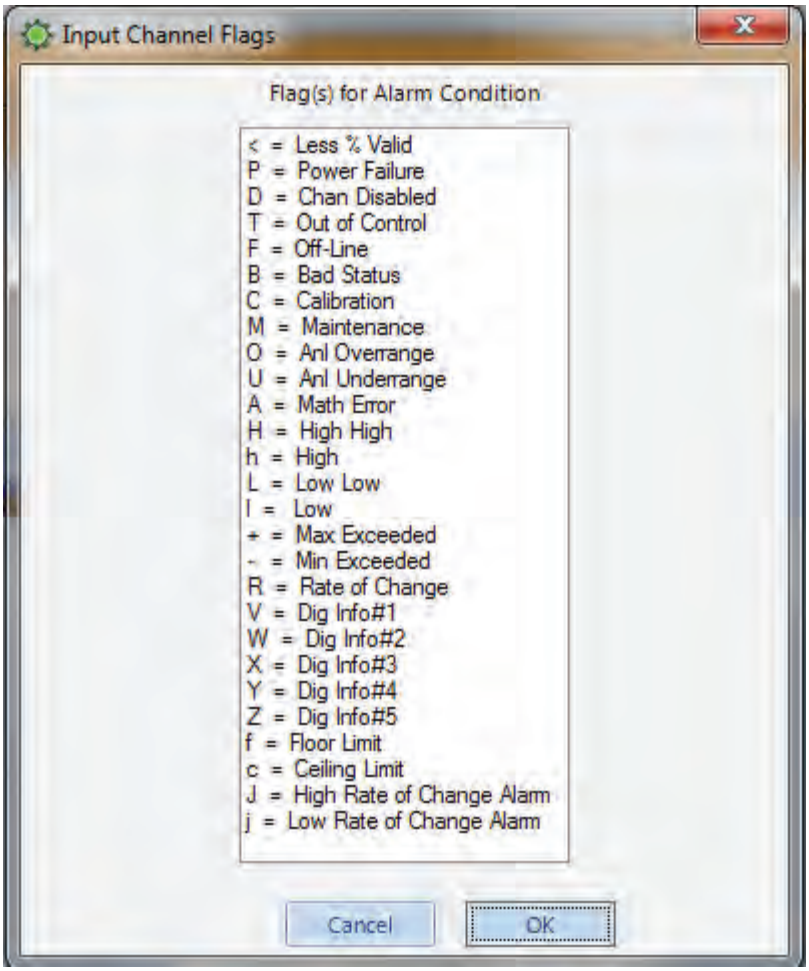


Output Alarms During Alarms--Line Status Pattern

If you selected **Output Lines During Alarm** click in the box to check the **Output Lines** that will trigger the alarm, then click **OK.**

Input Channel Flags > Ignore State Changes Flags

If you selected **Ignore State Changes Flags**, highlight the **Input Channel Flags** to **Ignore during State Changes**, then click **OK**.



Input Channel Flags > Flags for Alarm Condition

If you selected or **Flags for Alarm Condidtion,** highlight which **Input Channel Flags** will trigger an **Alarm Condition**, then click **OK**.

Click the **Save** icon on the ribbon.

This chapter describes the **Data Rollup Processor**, which allows shorter term averages to be rolled up into larger block or rolling averages.

Data Rollup Processor

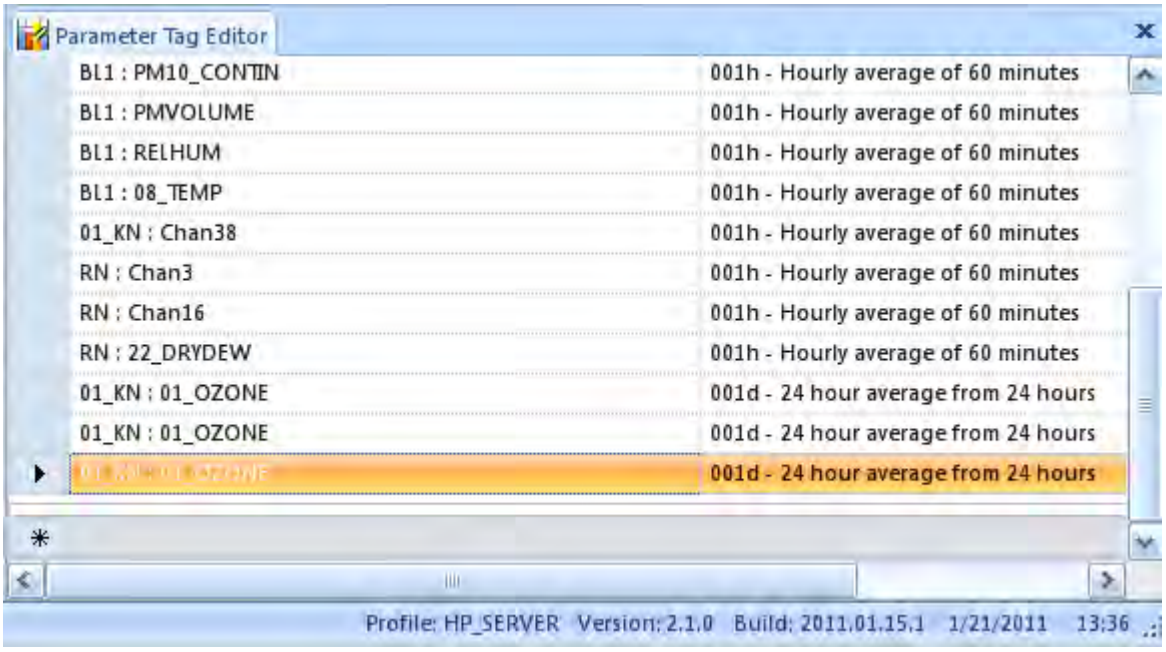
The Data Rollup Processor is an optional module, usually included as part of an Instrument Polling license. The Data Rollup Processor allows shorter-term averages to be rolled up into larger block or rolling averages. Examples of this would include:

Re-creating hourly data from 1-minute data
Rolling up 5-minute or other odd intervals from a directly polled instrument to hourly data
Rolling up hourly averages to daily averages
Creating a new parameter with an 8-hour rolling average (e.g., ozone) calculated within the 8872.

The calculation can be done both manually (**Utilities->Manual Average Data Rollup**) or it can be scheduled in **Configuration Editors>Task Scheduler**.

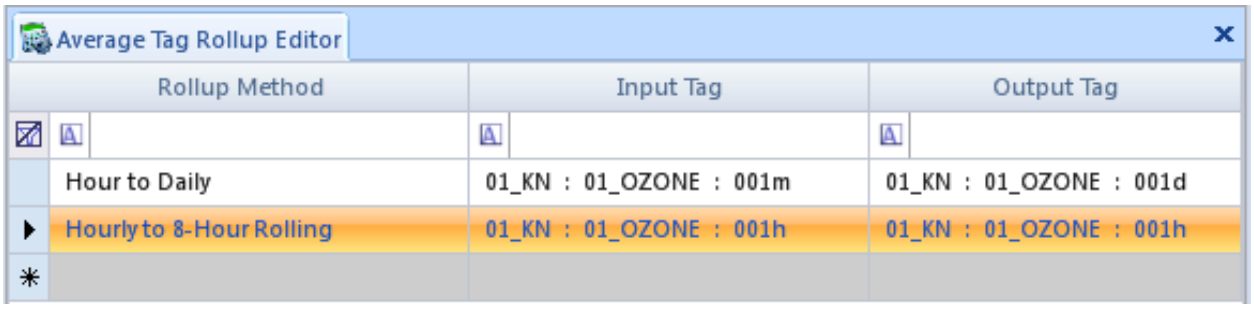
Before doing the calculation, set up the rollup programs and tie them to specific **Parameter Tags**. A **Tag** is a term for a combination of a parameter and an average interval (e.g., hourly ozone, 1-minute CO). The intervals are specific to the frequency at which data is inserted into the database, so the system can't distinguish between OZONE:1h that comes from a block average of minute data and OZONE:1h that is an 8-hour rolling average, updated on the hour. For rolling averages, create a new parameter in the Site/Parameter editor to store the rolling average data.

If you need to create new tags (e.g., create an daily average tag, or create the 1-hour tag for your new OZONE_8HR parameter), open **List Editors->Parameter Tag Editor**.


Parameter Tag Editor
BL1 : PM10_CONTIN
001h - Hourly average of 60 minutes
BL1 : PMVOLUME
001h - Hourly average of 60 minutes
BL1 : RELHUM
001h - Hourly average of 60 minutes
BL1 : 08_TEMP
001h - Hourly average of 60 minutes
01_KN : Chan38
001h - Hourly average of 60 minutes
RN : Chan3
001h - Hourly average of 60 minutes
RN : Chan16
001h - Hourly average of 60 minutes
RN : 22_DRYDEW
001h - Hourly average of 60 minutes
01_KN : 01_OZONE
001d - 24 hour average from 24 hours
01_KN : 01_OZONE
001d - 24 hour average from 24 hours
001d - 24 hour average from 24 hours
Profile: HP_SERVER Version: 2.1.0 Build: 2011.01.15.1 1/21/2011 13:36

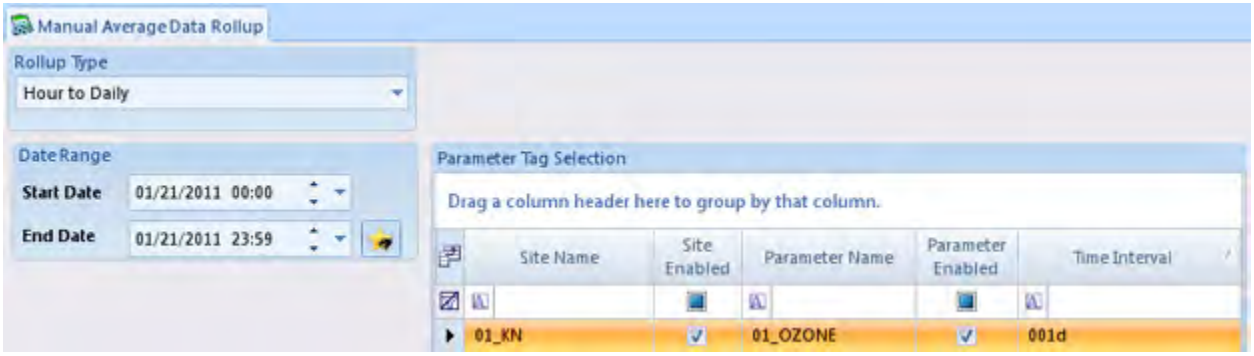
Create new tags in List Editors>Parameter Tag Editor

Once all the tags you need exist, use the **Configuration->Average Tag Rollup Editor** to create your new rollup programs:



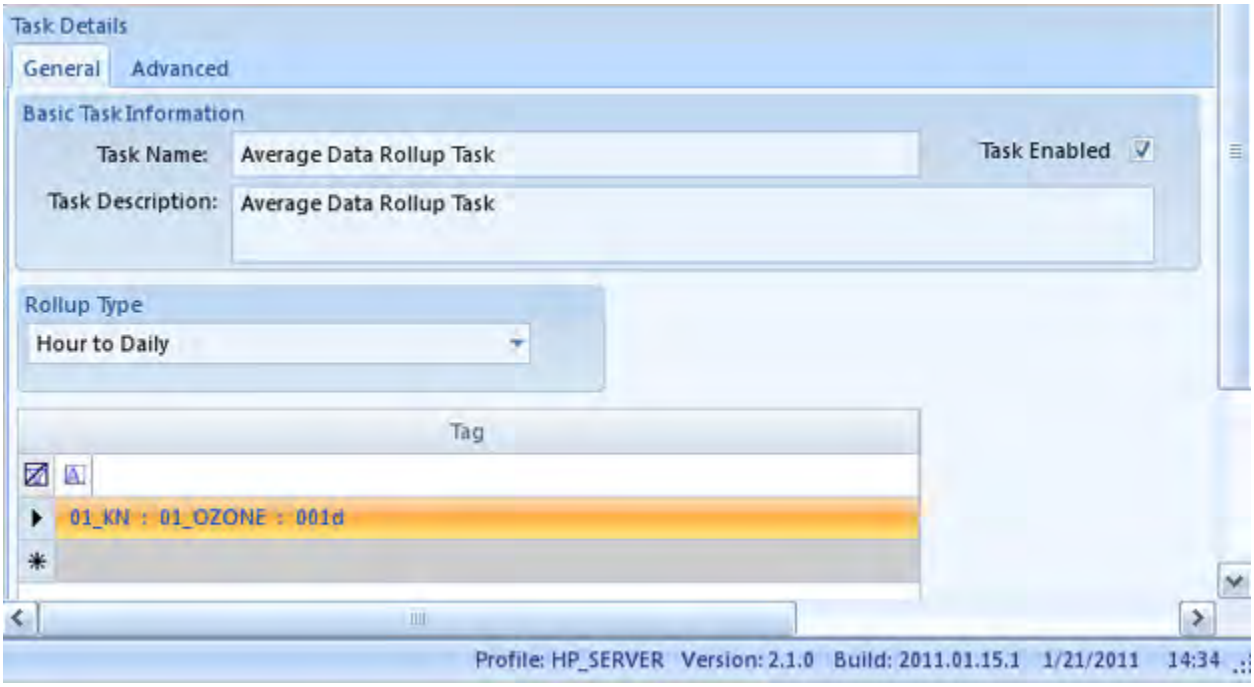
Utilities>Manual Average Data Rollup

To run a program manually, go to **Utilities>Manual Average Data Rollup**, select the **Rollup Type**, **Date Range**, and **Parameter Tag Selection**. Click the **Process Rollup** button.



To run a program manually, Utilities>Manual Average Data Rollup

To run a **Rollup Task** automatically, create a new **Average RollupTask** in **Configuration Editors>Task Scheduler>Average Rollup Task**, and select an **Average Data Rollup Task**. Then select the specific **Task Type**, **Start Time**, **Repeat Interval**, and **Task Description**.



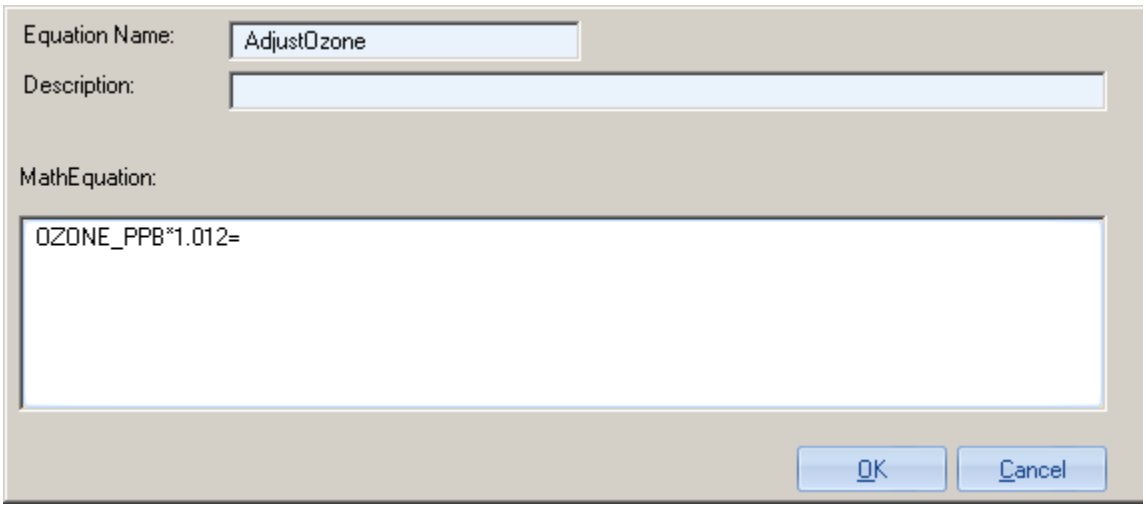
Automatic Rollup Task in Configuration Editors>Task Scheduler>Add Average Rollup Task

Central Math Processor

The 8872 includes the capability to perform mathematical calculations at the server, either on a manual basis, or as a scheduled task. To perform these calculations, you will need to define the mathematical calculation to be made in the Math Equation Editor (**List Editors > Math > Math Equation Editor)**. Each equation is given a name to reference (e.g., "SO2_Adjustment") which is then referenced in the math utility or the Task Scheduler.

Equations may act on any defined average interval, and must reference Parameter Templates, rather than specific site/parameter combinations. This allows a general equation to be configured once, and used for multiple sites without having to repeat the same equation.

To create a new equation, open **List Editors > Math > Math Equation Editor** and click the **Add Equation button.** Enter the **Equation Name** (required), and optional **Description**, and then the **equation**. The equation takes the form of parameter template names, operators, and functions. Parenthesis are supported.



Math Equation Editor from List Editors

Binary operators (operators on two variables) include:

*	Multiply
/	Divide
+	Add
–	Subtract
%	Modulo (remainder)

Other binary and Uniary functions (functions that operate on one variable or one result of another embedded equation) include:

Name	Description	Usage
Abs	Returns the absolute value of a specified number.	Abs(-1)
Acos	Returns the angle whose cosine is the specified number.	Acos(1)
Asin	Returns the angle whose sine is the specified number.	Asin(0)
Atan	Returns the angle whose tangent is the specified number.	Atan(0)
Cos	Returns the cosine of the specified angle.	Cos(0)
Exp	Returns e raised to the specified power.	Exp(0)
Log	Returns the logarithm of a specified number.	Log(1, 10)
Log10	Returns the base 10 logarithm of a specified number.	Log10(1)
Max	Returns the larger of two specified numbers.	Max(1, 2)
Min	Returns the smaller of two numbers.	Min(1, 2)
Pow	Returns a specified number raised to the specified power.	Pow(3, 2)
Round	Rounds a value to the nearest integer or specified number of decimal places. The mid number behaviour can be changed by using Evaluate Option. RoundAwayFromZero during construction of the Expression object.	Round(3.222, 2)
Sign	Returns a value indicating the sign of a number.	Sign(-10)
Sin	Returns the sine of the specified angle.	Sin(0)
Sqrt	Returns the square root of a specified number.	Sqrt(4)
Tan	Returns the tangent of the specified angle.	Tan(0)
Truncate	Calculates the integral part of a number.	Truncate(1.7)

⇨ **Important!** These equations MUST be referred to by the case-specific version of the equation. You must use “Max(x,y)”, not “MAX(x,y).”

For equations, Information flags are not propogated, while Validity flags are propagated from constituent channels. Consult the Flags Editor for details on which flags are considered Informational and Validation flags.

Scheduling Tasks

Some automatic actions in the 8872 are managed by the **Task Scheduler**, which runs as part of the background AirVision service. The Task Scheduler has three user interfaces:

- **Task Scheduler** (**Configuration Editors** > **Task Scheduler**) allows you to add, review, and edit individual and grouped task events.
- **Task Wizard** (**Configuration Editors** > **Task Scheduler** >**Run Schedule Wizard** button in ribbon at top of screen) allows you to create grouped polling events as well as events triggered by polling.

▶ **Note:** This Wizard is ONLY used for setting a Model 8872 to poll another device, like an instrument or another Model 8816 / 8832 data logger. It is not related to another server polling the 8872 itself.

- **Task Display (Utilities** > **Scheduled Task Status**) is a constantly updating display of all tasks within the system, including the last time run, next execution time, and errors experienced during the last run.

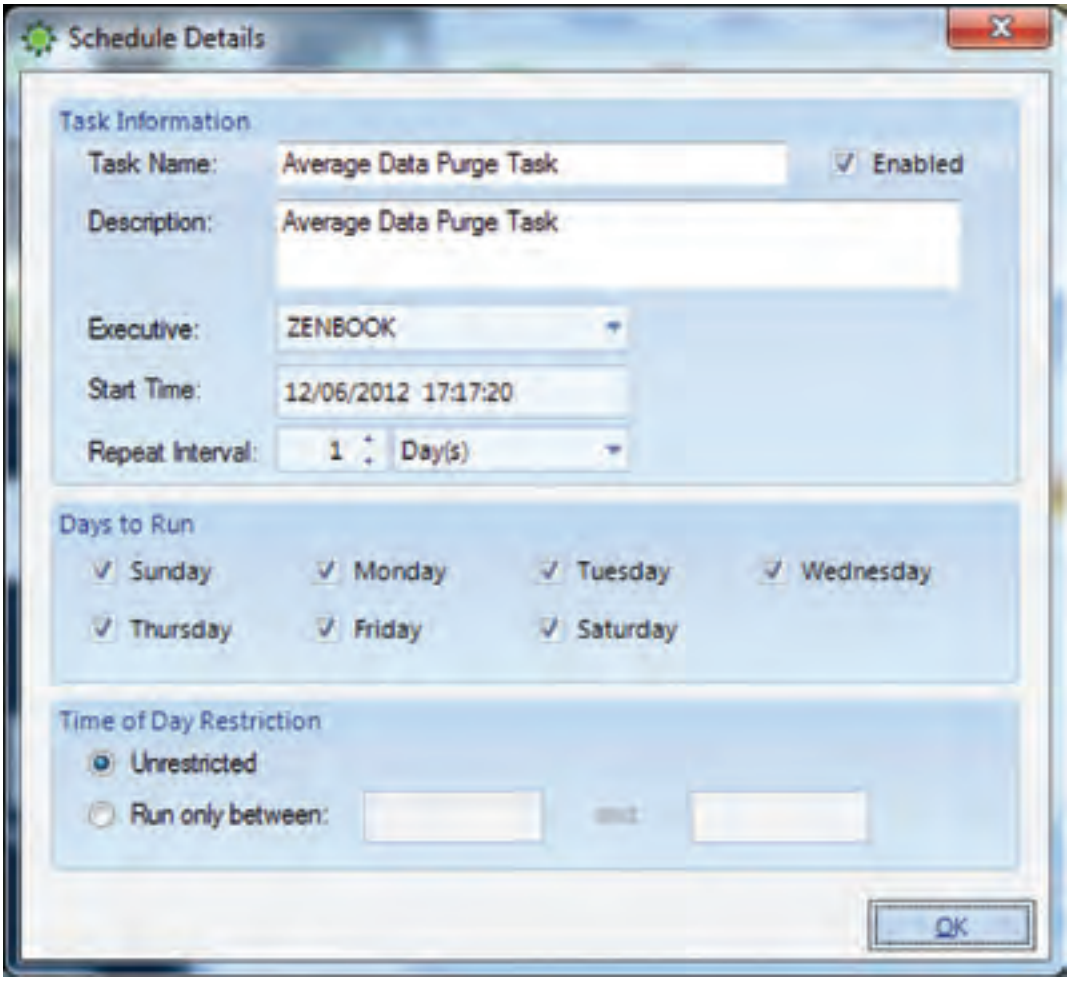
The following tasks can be configured in the Task Scheduler, depending on your licensed options:

- Alarm Processing Task
- Average Data Purge Task
- Average Rollup Task
- Database Sync Task
- Fill Average Data Gaps Task
- Instrument Poll Task
- Journal Message Purge Task
- Logger Poll Task
- Scheduled Command Line Task
- Scheduled Report Task
- SQL Execution Task
- New Task Group

Task Scheduler

The Task Scheduler screen has three sections:

- **Task Schedule** displays all scheduled tasks and cannot be edited.
- **Task Schedule Details** section is where you select an **Executive**, and **Start Time**, and a **Repeat Interval**. **Enabled** must be checked in this section before you can select **Enabled** in the **Scheduled Task Selection** section.
- An **Advanced** tab is provided next to the repeat interval to allow the user to specify if the task is only to run on certain days of the week, or only in a 'window' of certain hours of the day This is especially useful for polling tasks.



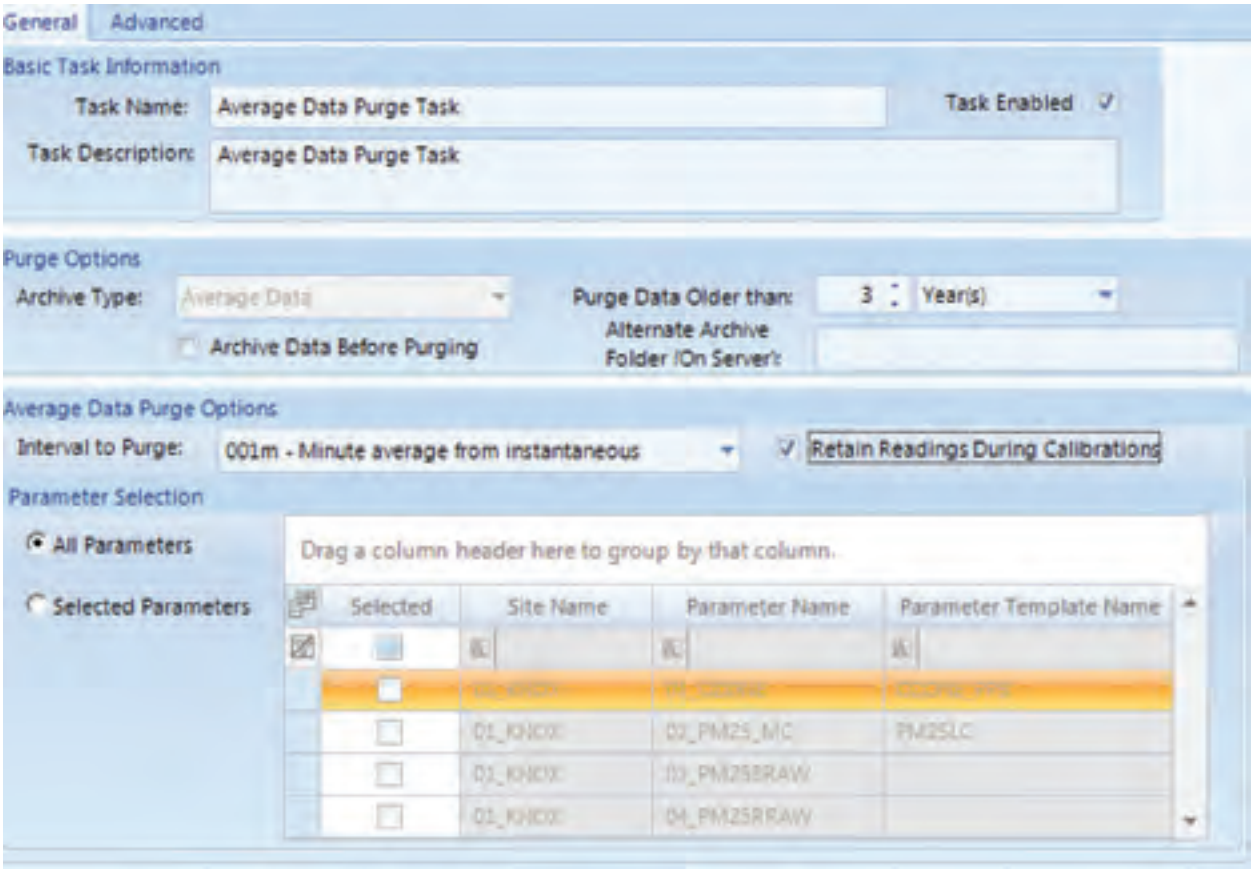
Task Scheduler showing a Logger Poll Task (Configuration Editors > Task Scheduler)

To configure an individual task in the **Task Scheduler** (**Configuration Editors** > **Task Scheduler**), click the **Add** button in the ribbon at the top of the screen and select one of the following categories:

- **Alarm Processing Task** reviews alarm Triggers for matches, creates alerts, and tells the 8872 when to process a particular alarm rule. If you use task groups and designate tasks to run in sequence, you can designate alarms to processed immediately after a data poll. (Alarm Processing is not used in the 8872.)
- **Average Data Purge Task** purges or archives old data from the database. Eventually, the 8872 database becomes so big that it takes a long time to back it up, so it is helpful to remove and/or save old data, in particular minute data. You can choose any average interval to be scheduled for Purge or Archive. Purged data will be permanently deleted from the database. Archived data is copied to an external file before purging. Archived data is stored with all flags and annotations and can be re-imported later.The Model 8872 uses specialized data keys so sites and channels can be renamed or renumbered and archived data can still be correctly imported. Select the age of the data to purge: **Purge Data Older Than** a specified number of seconds, minutes, hours, days, weeks, or years. We recommend purging 1-minute data older than 1 year to keep the database within allowable size.

▶ **Note:** Average Data can be purged manually via the **Utilities menu>Purge Average Data**.

A checkbox option allows you to **retain data during calibrations**. If selected, any data flagged with the **C** flag will not be purged. This allows you to retain minute data from calibrations (e.g., for use in the Calibration Trend Graph's Response Plot) while still removing old minute data.



Purge or archive data in Configuration Editors > Task Scheduler

- **Fill Average Data Gaps Task** prepopulates Average Data Records to make them continuous where data is missing. This task inserts top of the day blank records in the database to improve reporting and data query performance. Filling average data gaps is critical for optimizing the performance of 8872 reporting, and should be configured to run every day after midnight in every system.Each system needs only one of these tasks. The screen defaults to a repeat interval of one day and a time to run of 00:00:00 (midnight).
- **Journal Message Purge Task** removes Event Log journal messages (internal error logs) that are older than a specified age in seconds, minutes, hours, days, weeks, or years. The purge occurs at a specified **Repeat Interval**. An option is available to **Archive Data Before Purging**. Agilaire recommends purging entries older than 2 weeks.
- **Logger Poll Task** would would only be used if the 8872 is used in conjunction with an existing 8816/8832.

▶ **Note:** The logger also can be polled manually via **Utilities>Manual Poll**.

- **Scheduled Command Line Task** allows you to automatically execute any DOS command line, such as a batch file or .exe file (e.g., NTbackup.exe).

- **Scheduled Report Task** automatically sends scheduled reports to a designated printer, emails reports to configured recipients, or saves them to a file.
  - Click the green **Add** button and select **Scheduled Report Task**
  - In the **Task Schedule Details** section, select **Executive, Start Time,** and **Repeat Interval**.
  - In the **Task Details** section, enter a **Task Name** and enter an optional **Task Description**, and click to select **Enabled**.
  - In the **Report Task Options** section, select a **Report** from the drop-down list.

    Click the **Configure Report Query** button to select **Date Range**, **Average Interval**, and **Parameter(s)**. The **Query String** will be displayed near the bottom of the screen. Click **OK** to save the configuration.
  - In the **Output Options** section, click the **Printing Options tab** if the report will be printed. Select **Enable Printing** and designate the **Printer Path**.
  - If the report will be emailed, select the **Notifications Options tab**, check **Enable Notifications**, and enter a **Notification Publication Description**. (**Users** and/or **User Groups** must be designated in **Configuration Editors** > **Security** before Notifications will be sent.)
  - If the report will be saved to a file, open the **File Output Options tab** and select an **Output File Type** (comma separated, Excel, image, text, HTML, PDF, or rich text) from the drop-down list. This option can be used to write the scheduled report to a local or network drive, and/or to FTP the file to a particular FTP server.

    Enter a **File Output Base Name**. (Windows does not allow "/" or ":" characters in file names.)

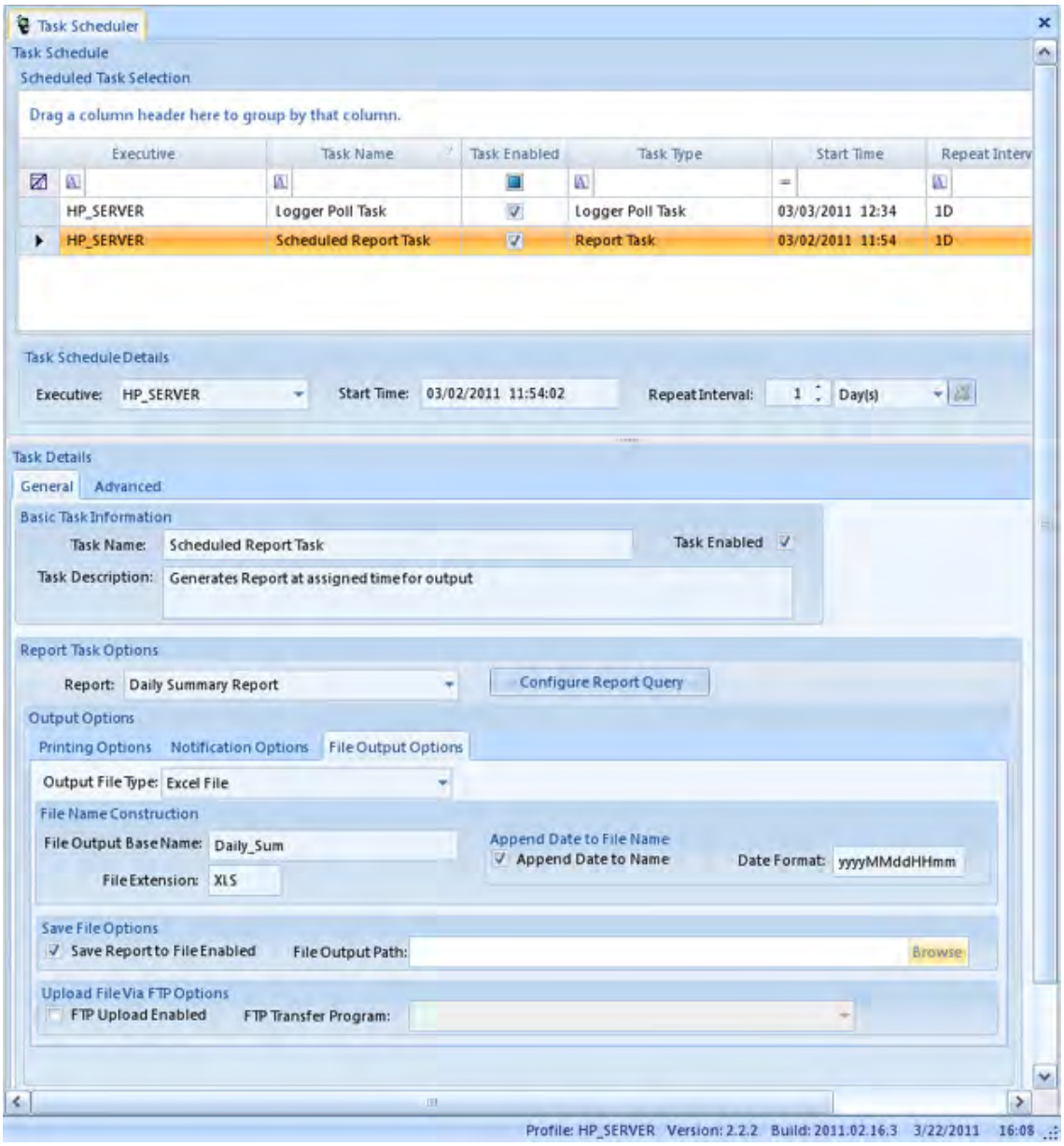
    The **File Extension** will be filled in automatically from the Output File Type selected.

    To have the scheduled task append the current date/time to the file name, select **Append Date to Name** and a **Date Format**, for example, Daily_Sum201106271900. Selecting this option ensures that new files do not overwrite existing files in the directory. If this option not selected, the task will overwrite the file each time the task runs.

    To **Save** the file, check **Save Report to File Enabled** and browse to a **File Output Path**.

    To **Upload File Via FTP Options**, select **FTP Upload Enabled** and select an **FTP Transfer Program** from the drop-down list of configured FTP programs.

    Click the **Save icon** on the Ribbon to save the task.

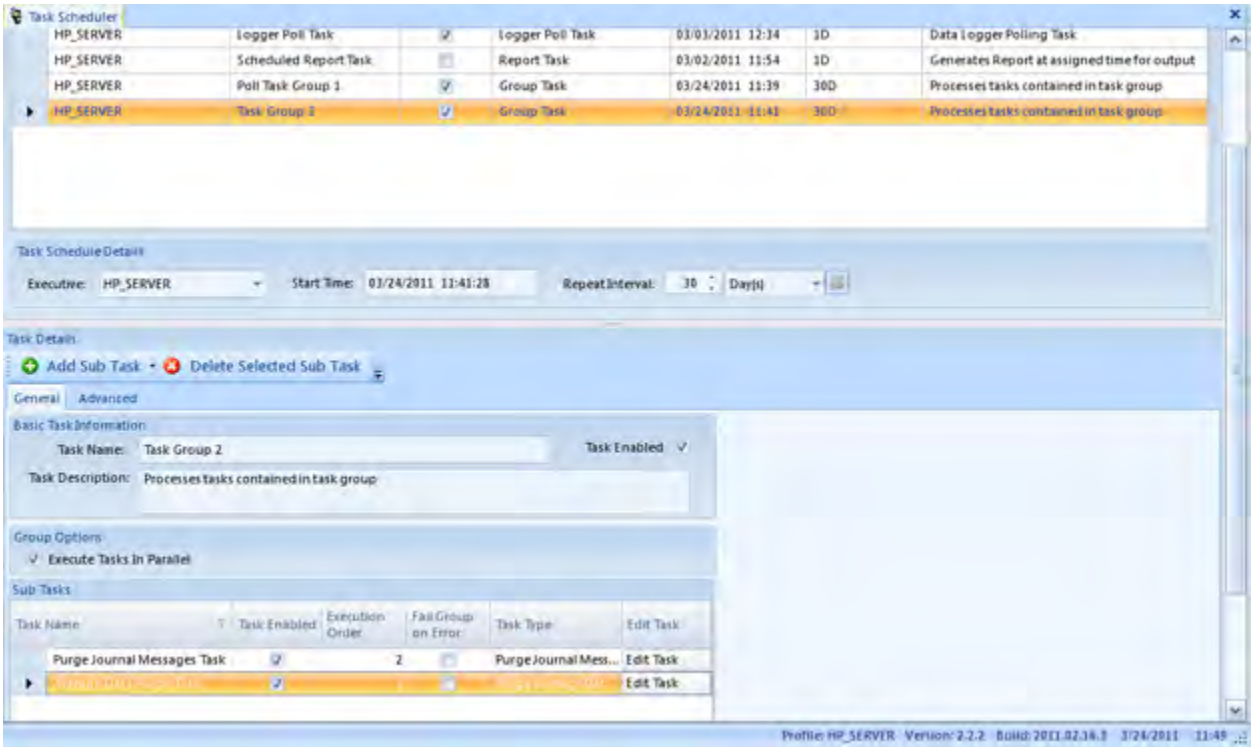


Schedule Report Task (Configuration Editors > Task Scheduler > Add Scheduled Report Task)

- **SQL Execution Task**
  - To add a **SQL Execution Task,** click the green **Add** button on the ribbon and select **SQL Execution Task.**
  - **Select the Executive, Start Time, and Repeat Interval.**
  - Name the SQL task or use the default name.
  - Enter the **SQL Command Text**.
  - Click the **Save** button.
- **New Task Group**
  Task Groups allow multiple tasks to be grouped together in one polling process instead of multiple individual tasks. A Task Group consists of Sub Tasks. Tasks can be defined to run groups in parallel, sequentially, or as sub tasks of other task groups to allow mixing of parallel and sequential operations.
  - To create a Task Group, click the green **Add** button on the Ribbon in the **Task Scheduler** and select **New Task Group**.
  - In the **Task Schedule Details** section of the Task Scheduler, select an **Executive**, **Start Time**, and **Repeat Interval**.
  - In the **Task Details** section of the screen, enter a **Task Name**. The **Task Description** will be filled in automatically, but it can be modified.
  - Check **Enabled** if you want the Task Group to be activated when you save it.
  - In the **Group Options** section, check the box if you want to **Execute the Tasks in Parallel**; otherwise, they will be executed sequentially or as sub tasks of other task groups.

    If the sub tasks are to be run sequentially, leave the **Execute the Tasks in Parallel** box unselected and enter a number in the **Execution Order** column in the **Sub Tasks** section.
  - To create the Task Group, add a **Sub Task** to the Task Group. Click the green **Add Sub Task** button in the **Task Details** section and select a task from the drop-down list. (The Sub Task drop-down list has the same options as the Add task button at the top of the Task Scheduler.)
  - When you select a Sub Task from the list, a new screen will pop up for the Sub Task you selected. Fields in the pop-up screen vary according to which sub task is selected.
  - **Advanced Options** in the pop up screens (not required) allow configuration of **Number of Retries** and the **Interval between Retries**.
  - When you configure the Sub Task and click **OK** in the pop-up screen the new **Task Name** will be added in the **Sub Tasks** section. The Task Name can be modified.

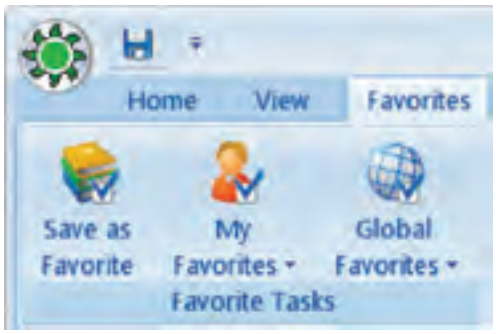
- Select the **Fail Group on Error** column in the **Sub Tasks** section if you want the whole Task Group to stop running if an error occurs.
- **Task Type** in the **Sub Tasks** section indicates the sub tasks that are part of one group task.
- Click in the **Edit Task** field to make changes in the same pop-up window that came up when the **Add Sub Task** button was clicked.
- To remove a task from the Task Group select the task in the **Sub Task** section and click the **Delete Selected Sub Task** button.


Task Scheduler
HP_SERVER Logger Poll Task Logger Poll Task 03/01/2011 12:34 1D Data Logger Polling Task
HP_SERVER Scheduled Report Task Report Task 03/02/2011 11:54 1D Generates Report at assigned time for output
HP_SERVER Poll Task Group 1 Group Task 03/24/2011 11:39 30D Processes tasks contained in task group
HP_SERVER Task Group 2 Group Task 03/24/2011 11:41 30D Processes tasks contained in task group
Task Schedule Details
Executive: HP_SERVER
Start Time: 03/24/2011 11:41:28
Repeat Interval: 30 Day(s)
Task Details
Add Sub Task
Delete Selected Sub Task
General
Advanced
Basic Task Information
Task Name: Task Group 2
Task Enabled
Task Description: Processes tasks contained in task group
Group Options
Execute Tasks In Parallel
Sub Tasks
Task Name
Task Enabled
Execution Order
Fail Group on Error
Task Type
Edit Task
Purge Journal Messages Task
2
Purge Journal Mess...
Edit Task
Edit Task
Profile: HP_SERVER Version: 2.2.2 Build: 2011.02.16.3 3/24/2011 11:49

Task Group (Configuration Editors > Task Scheduler > Add > New Task Group)

Favorites Editor

The Model 8872 simplifies regular tasks with a list of user-defined **Favorites**, which function like Favorites in Internet browsers. Favorites can be created for most menu items, including reports, editors, configurations, journals, calibration functions, security settings, logger functions, emails, and task scheduling. Favorites can be saved for different sites, parameters, average intervals, and date ranges. They can be saved for all users or for one user.



Favorites menu

Creating a Favorite

To create a favorite, open **Configuration Editors > Favorites Editors**. Click the red **Add Favorite button** on the left side of the ribbon.

▶ **Note:** Favorites can also be created inside Reports by selecting the **Favorites tab** and clicking the **Save as Favorites icon**.

Add a Favorite screen

Favorite Detail Tab

Under the **Favorite Detail** tab of the Favorites Editor: select a **Menu Item** from the drop-down list, enter a **Favorite Name**, enter a **Favorite Description** (optional), select a **Favorite Scope** from the drop-down list (**User** or **All Users**) and select from the following options:

- **Launch on Application Startup** to run the Favorite upon logging in to the 8872
- **Run Query on Launch** to execute data retrieval when the Favorite is selected.

Favorite Query Tab

Next, open the **Favorite Query** tab if it is available.

▶ **Note:** The Favorite Query tab will only be in the Favorites Editor after a Menu Item is selected that requires a time range, interval, and parameter(s), such as the Average Data Report and the Average Data Editor.

Select a **Date Range**, choose an **Average Interval** and select a **Parameter**. To select more than one parameter, drag the arrow in the blue left column or hold down the **Ctrl** key while you select parameters.

To save a favorite when you're in any data editor or report, complete a query, and select **Favorites** from the top menu. The ribbon bar will change to show the favorites menu.

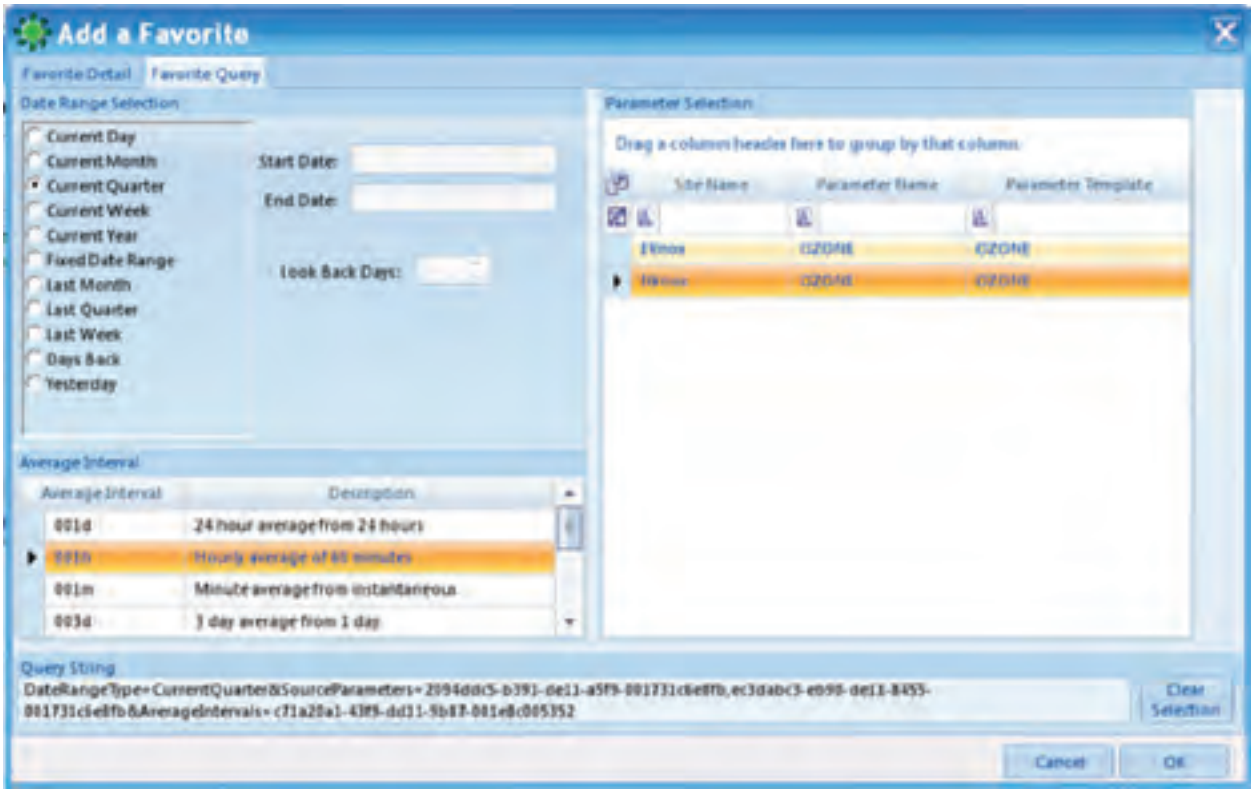
Select **Save as Favorite** to bring up the **Add a Favorite** screen.

You can also configure the **Favorite** by selecting the **Favorite Query** tab after you select **Save as Favorite**. From this screen you can adjust the site/parameter list, date range, or average interval. These values can also be adjusted later in the **Favorites Editor** in the **Configuration menu**.

To return to the ribbon controlling the current application, select the top menu function (above the ribbon), for example, Average Data Editor.

To use an existing Favorite, select **Favorites** from the top menu (above the ribbon bar), select **User Favorite** or **Global Favorites**, and the saved **Favorite**.

A copy button on the ribbon allows you to copy an existing favorite for slight modification, if needed.



Favorite Query tab from Add a Favorite

GSI Driver Editor

The purpose of the GSI Driver Editor (**Editors>GSI Driver Editor**)is to provide a way to add, delete, or modify GSI driver entries in an editor similar to the Parameter Template editor for GSI entries and GSI instruments.

The GSI Driver Editor consists of an alphabetized pick-list of existing GSI entries for modification. Two editors are provided, one for instruments and one for entries, or two sections/tabs of the forms.

Fields in the GSI Driver Entry tab include:

- GSI Entry
  - Associated GSI Instrument and GSI Entry (pick-list of configured instruments)
  - Send Name (string)
  - Parse Name (string, up to 8 char)
  - AutoSend String (string up to 8 char)
  - Autosend Repeat Interval (1..60 seconds)
  - Parse Sync String
  - Modbus Register
  - Fixed or Delimited Parsing
    - Fixed:
      - Number of Chars to Data (int, up to 3 digits)
      - Data Field Width (int, up to 2 digits)
      - Number of Chars in string (int, up to 3 digits)
    - Delimited:
      - Number of Delimiter Chars (string)
      - Number of Delimiters of Delimiters to Data (int, up to 3 digits)
      - Number of Delimiters In String (int, up to 3 digits)
      - Data Field Type (pick-list- Hex, Binary, Float)
- In the GSI Driver Instrument tab:
  - GSI Instrument Name
  - Default TCP Port (integer, up to 6 digits)
  - Default Modbus Code (integer, 0-255)
  - Default Modbus Command Type.(3 or 4)

Consult the Model 8816/8832 Data Logger Manual for details on the use of these fields.

Configuring Security

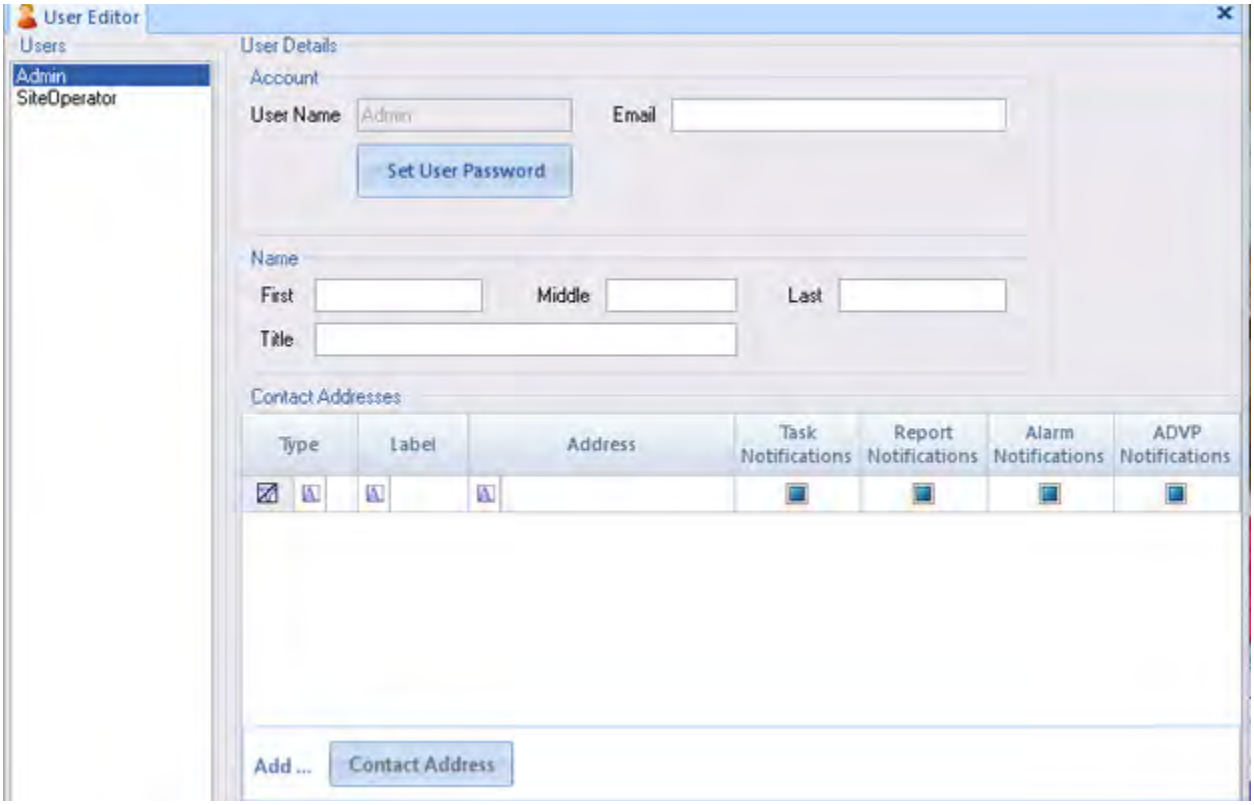
User security in the 8872 is set up by administrative personnel and is similar to Microsoft Windows:

- Each system user has an identity, including a username and password
- A User may be a member of one or more User Groups
- Access and rights are assigned to User Groups

User Groups in the 8872 are usually assigned by job responsibility Users can be members of more than one **Group**, and each site can have a different access group.

User Editor

Administrators can add or delete users: open **Configuration Editors** > **Security** > **User Editor** and click **Add User** (or **Delete User**) button. Enter an **Email** address (optional). Click **Save**.

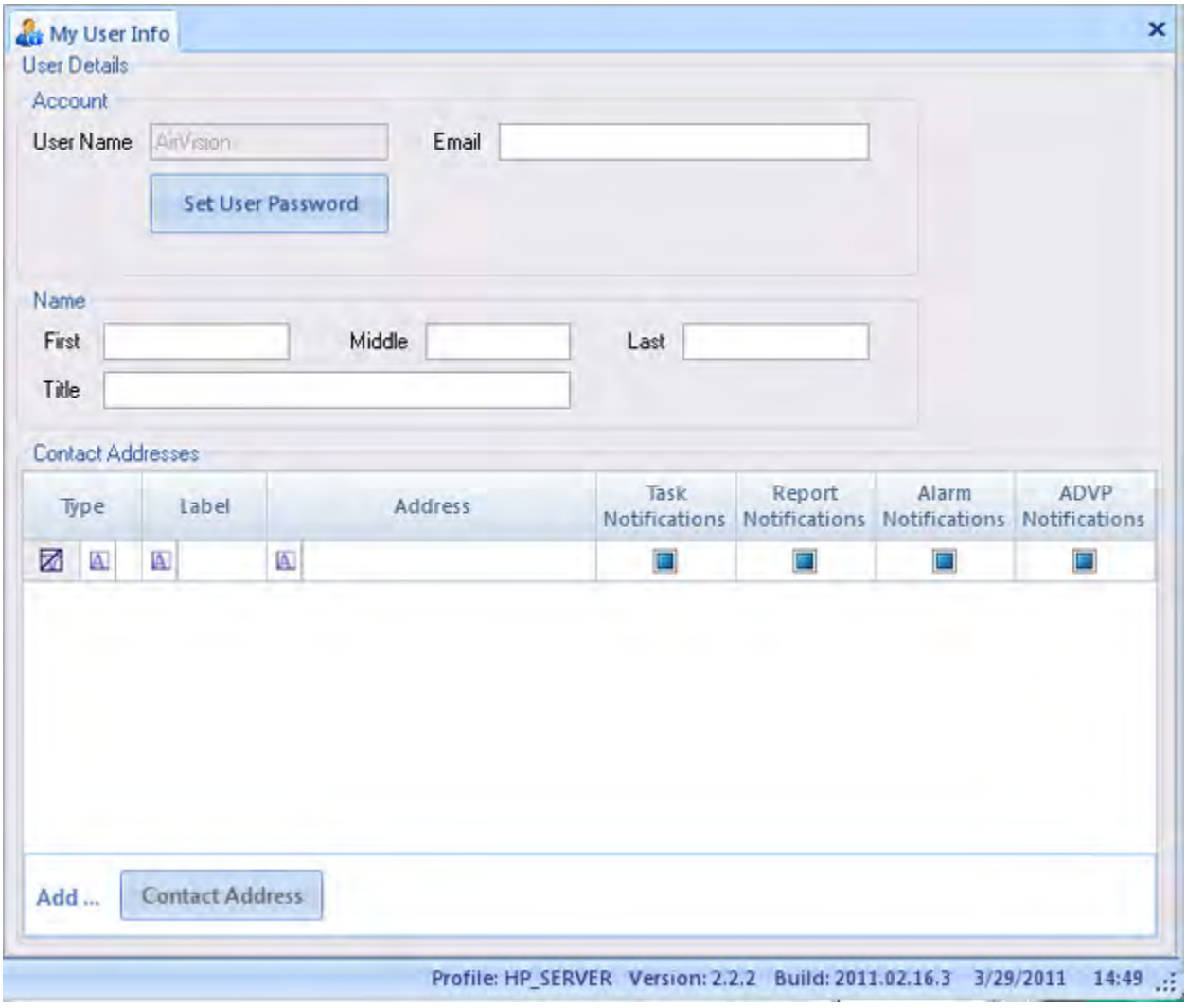


User Editor from Configuration Editors > Security > User Editor

My User Settings

Although the Model 8872 shares the same security model as AirVision, the use of Group Permissions is often not necessary, or relegated only to two access levels (one for full configuration access, one for access to displays and reports only.

Non-administrative personnel can change their own Password, Email, and Name, but not their User Name in the **My User Info** screen in **Configuration Editors** > **Security**. If a User Name needs to be changed (for example, if a name is misspelled), an Administrator would have to delete the original User Name and add a new one.



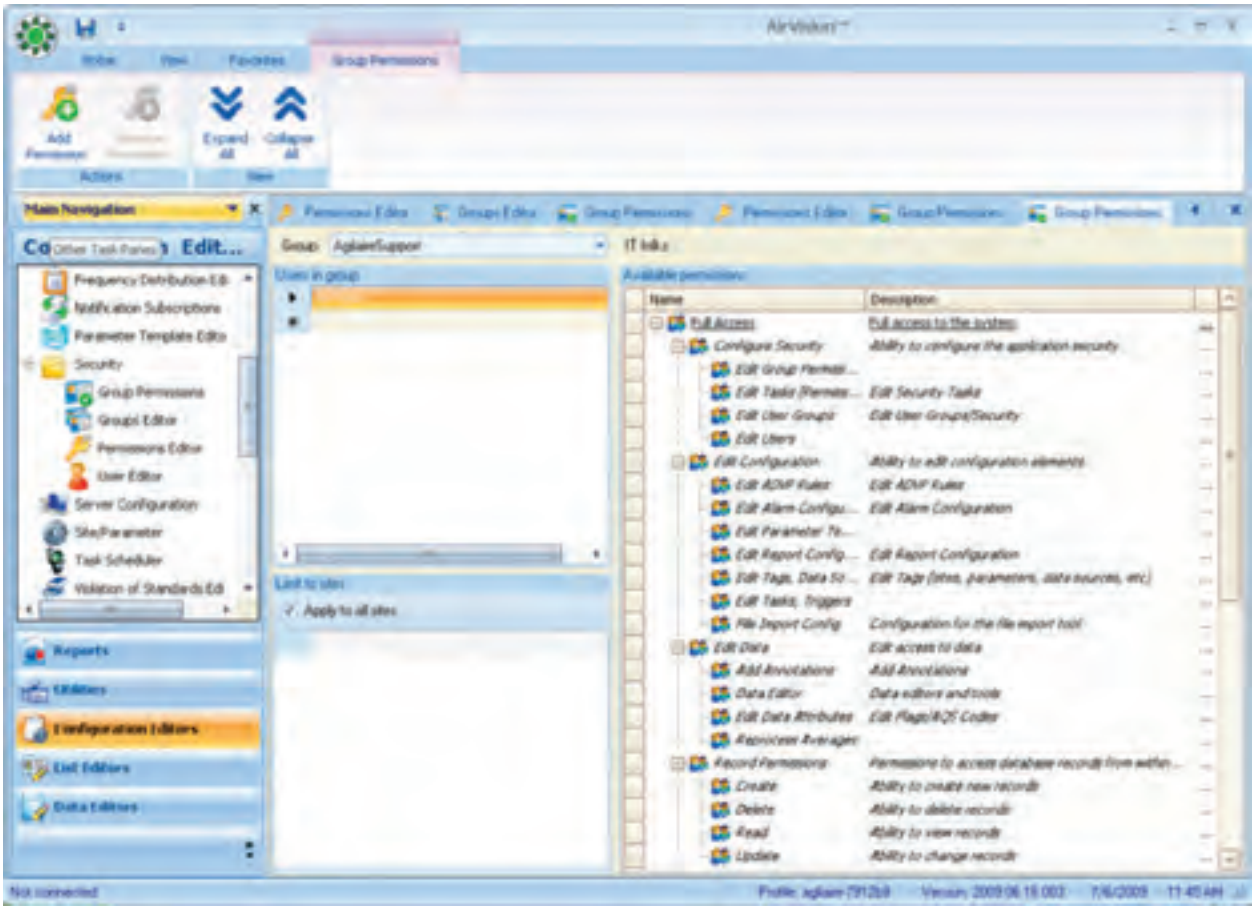
My User iNFO screen in Configuration Editors > Security

Group Permissions

Finally, define the permissions for each **User Group** using the **Configuration Editors** > **Security** > **Group Permissions Editor**. Select a Group in the drop-down list. The list of configured users is displayed (and users can be added here as well). The right panel shows the various rights available in the system, and the status for the current group:

- Grayed = access disabled
- Black, underlined = access enabled
- Black, italic = access enabled by inheriting from another granted access.

In this example, access has been granted to certain Security permissions (Groups, Users, and User Groups, but not Edit Tasks). Access is granted to all configuration items at the topmost level, and all sub-tasks are permitted by inheritance. For example, to turn off Edit ADVP Rules, first remove the overall Edit Configurations permission and then add the individual permissions. Expand and Collapse the tree diagram using the buttons on the ribbon.



Group Permissions from Configuration Editors > Security > Group Permissions Editor

Chapter 4

Reports

After data has been polled, either by a scheduled task (**Configuration Editor>Task Scheduler**) or manually (**Utilities>Manual Poll**) the 8872 can run the following reports after the Criteria Pane has been configured:

Basic Reports

- Daily Summary Report
- Daily Parameter Report
- Monthly Report

Calibration Reports

- Calibration Results
- Calibration Trend Graph
- Calibration X-Bar-R Chart

Configuration Reports

- Calibration Configuration Report
- Channel Configuration Report
- Parameter Configuration Report
- Scheduled Tasks Report
- Site Configuration Report

Internal Reports

- DB Modification History?
- Exception Journal?
- Historical Log Viewer?
- Journal Message Log
- Software Version Report
- Table Size Information

Logger Reports

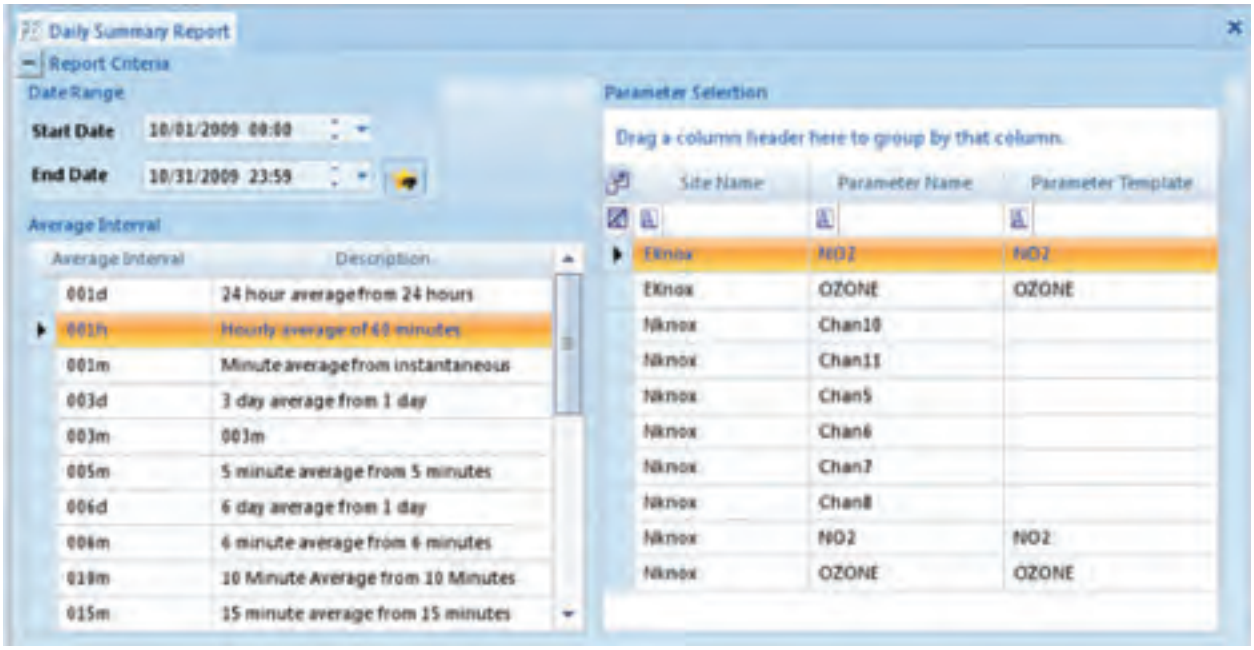
- Alarm Journal
- Input Line Status Report
- Power Failure Report

Other Reports

- Annotations Report
- LogBook Report

Criteria Pane

All reports use a Criteria Pane to select a time range and list of pollutants for the report.


Daily Summary Report
Report Criteria
Date Range
Start Date 10/01/2009 00:00
End Date 10/31/2009 23:59
Average Interval
Average Interval Description
001d 24 hour average from 24 hours
001h Hourly average of 60 minutes
001m Minute average from instantaneous
003d 3 day average from 1 day
003m 003m
005m 5 minute average from 5 minutes
006d 6 day average from 1 day
006m 6 minute average from 6 minutes
010m 10 Minute Average from 10 Minutes
015m 15 minute average from 15 minutes
Parameter Selection
Drag a column header here to group by that column.
Site Name Parameter Name Parameter Template
EKnox NO2 NO2
EKnox OZONE OZONE
Nknox Chan10
Nknox Chan11
Nknox Chan5
Nknox Chan6
Nknox Chan7
Nknox Chan8
Nknox NO2 NO2
Nknox OZONE OZONE

Report Criteria pane in Reports > Daily Summary Report

You can select the Date Range any of the following ways:

- Manually type in a month, day, year, and time.
- Click in a date field (the month, date, year, hour, minute) and click the small up or down arrow keys to raise or lower that field (month, day, year, hour, minute). (It isn't necessary to highlight the field, just put the cursor in it.)
- Use the bigger down arrow control to bring up a **Calendar.** You can click the arrows to change the month, or click the name of the month or year to bring up a list.
- Use the **Star** button to select from a pre-defined date range:

  Current Day
  Yesterday
  Current Week
  Last Week
  Current Month
  Last Month
  Current Quarter
  Last Quarter
  Current Year
  Number of days back from current day

In addition, the time criteria (e.g., the star icon button) allows you to choose “shift forward one day” or “shift backward one day.” If you select one of these and hit apply, it acts similar to the “Data Forward” or “Data Backward” buttons, except always shifting by 24 hours, rather than the size of the data window. This is useful for reviewing calibration minute data for several days, where the calibration falls on the same time each day.

Scroll to select an **Average Interval** (most reports only support one average interval at a time).

Click to select a site and parameter; use standard Windows Shift-Click and Control-Click conventions to select multiple parameters.

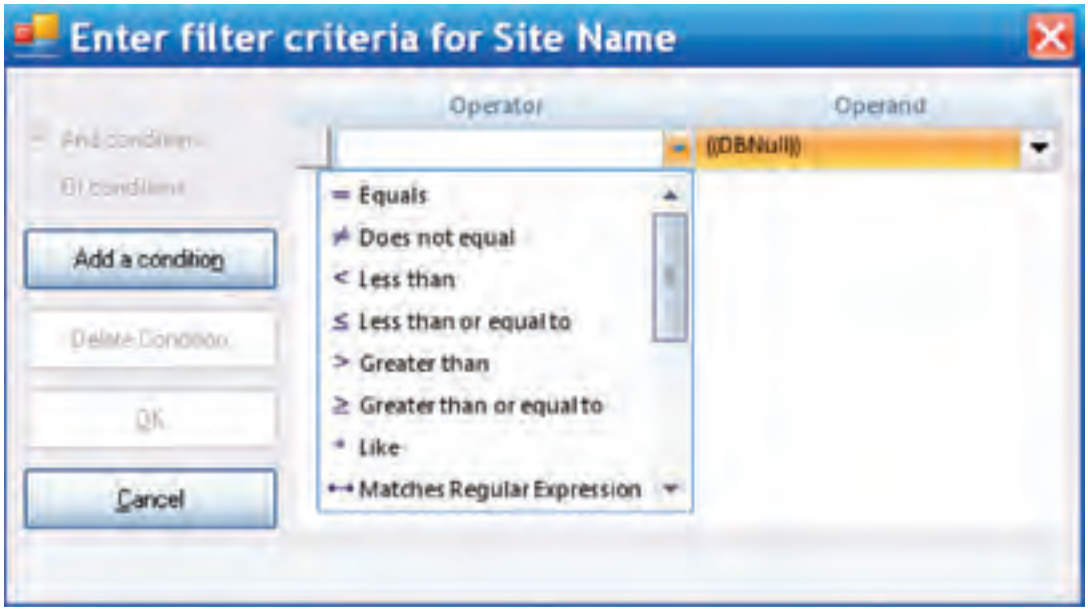
Filters

Filter fields are available in the top row of each column. Click in the row to use the filter to list a single site, parameter, or parameter template.

Click the down-arrow to the right of each filter field to select a particular entry in the column. Choices in the drop-down list will be Custom, Blanks, Non-blanks, plus each entry in the column (site name, parameter names, or parameter templates)

To write your own criteria, select **Custom** and configure the screen that pops up.

Filter fields in Reports criteria pane

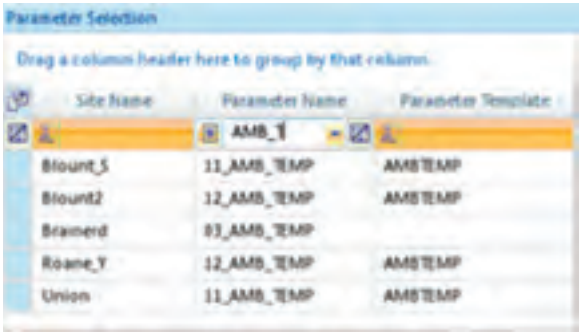


Custom filter criteria screen

Click the box with the letter **A** in the left side of each filter field to change the filter field from the default of **Starts With** to one of the following:

Equals
Does not equal
Less than
Less than or equal to
Greater than or equal to
Like
Matches Regular Expression
Starts with
Contains
Ends with
Does not start with
Does not contain
Does not end with
Does not match
Not like

For example, if you imported E-DAS data and used the option to put the channel number in front of the channel name, you might end up with some ozone channels that were "01_OZONE" while others were "03_OZONE" and "04_OZONE". Using the boxed "A" filter, you could search for all parameters names that contain ""Ozone" and more easily select them from a large list of parameters. Using a filter makes it easy to see a Parameter Template for was not set for 3_AMB_TEO_AMB_TEMP.

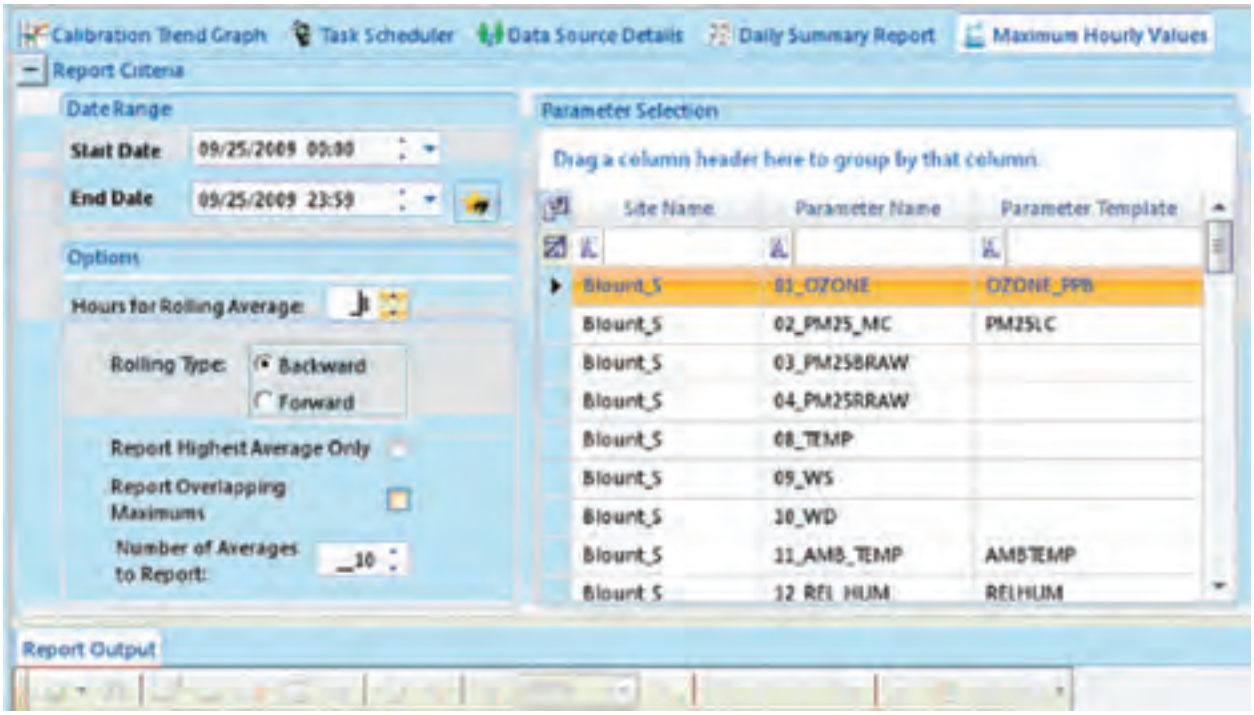


Using a filter to determine which parameters do not have a template

Additional Fields for Specific Reports

For some reports, the Criteria Panel is expanded with additional fields. For the Maximum Hourly Averages report, additional information is needed on how the data in the report should be filtered and calculated:

- Rolling hours, and time-tagging type
- Report highest average only for any day
- Allow report of overlapping maximums (for multiple hour rolling averages)
- Number of maximum averages to report



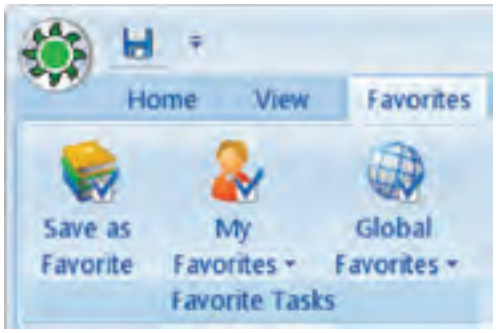
Additional Report Criteria required for Maximum Hourly Values report

Other reports with additional criteria include:

- Wind / Pollution Rose requires you to designate which Wind Rose report profile to use.
- AQS/XML Report requires you to choose which kinds of records to be assembled.
- Concentration Distribution, Frequency Distribution, Monthly Reports all allow you to designate an N-hour rolling average as an option.

Favorites

The Model 8872 simplifies regular tasks with a list of user-defined **Favorites**, which function like Favorites in Internet browsers, such as Internet Explorer. You can save a selection of sites, parameters, average intervals, and date ranges for the **Average Data Editor** or any **Data Report**.



Favorites menu

Favorites can be saved as a global favorite for all users, or as a favorite for an individual user. To create a favorite, go into any data editor or report, complete a query, and select **Favorites** from the top menu. The ribbon bar will change to show the favorites menu.

Select **Save as Favorite** to bring up the **Add a Favorite** screen.

Give the favorite a name, a description (optional), and select **User** or **All Users** (global) and select from the following options:

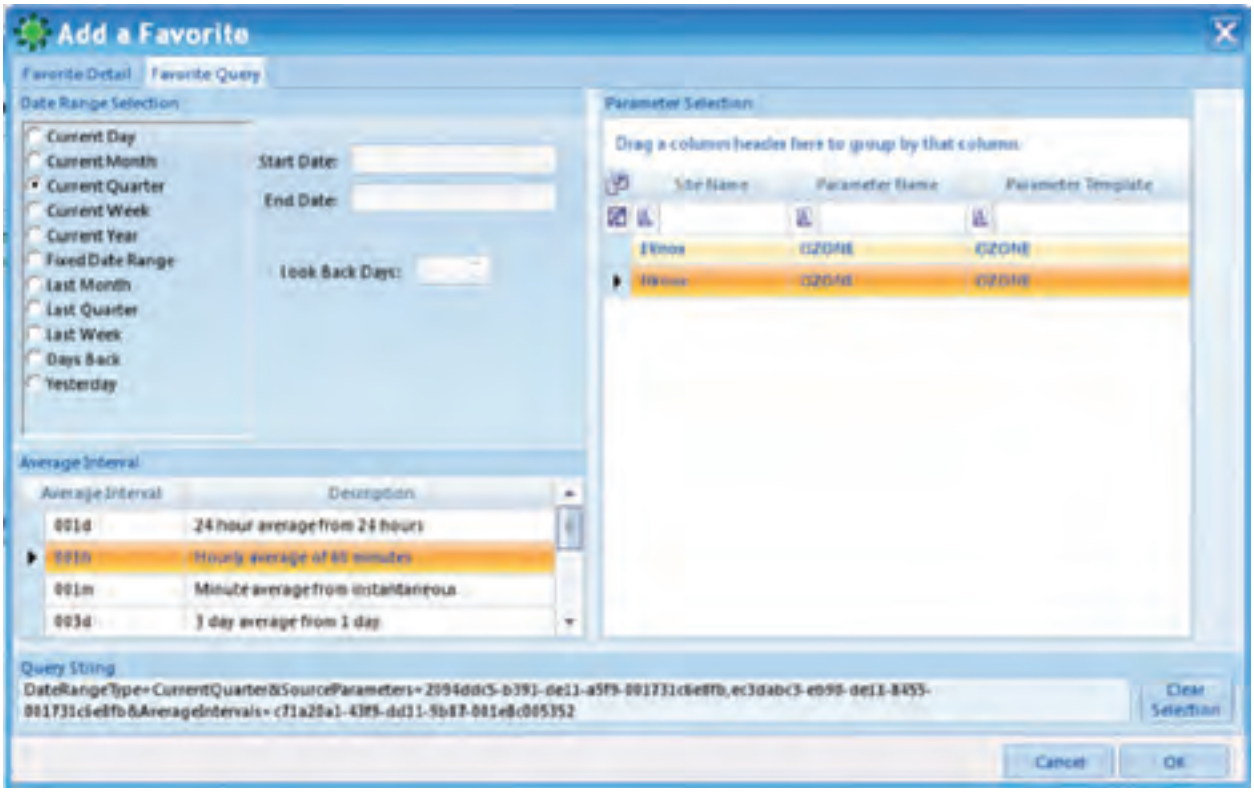
- **Launch on Application Startup** to run the Favorite upon logging in to the 8872
- **Run Query on Launch** to execute data retrieval when the Favorite is selected.

Add a Favorite screen

You can also configure the **Favorite** by selecting the **Favorite Query** tab after you select **Save as Favorite**. From this screen you can adjust the site/parameter list, date range, or average interval. These values can also be adjusted later in the **Favorites Editor** in the **Configuration menu**.

To return to the ribbon controlling the current application, select the top menu function (above the ribbon), for example, Average Data Editor.

To use an existing Favorite, select **Favorites** from the top menu (above the ribbon bar), select **User Favorite** or **Global Favorites**, and the saved **Favorite**.



Favorite Query tab from Add a Favorite

Basic Reports

Daily Summary Report

The **Daily Summary Report** is usually used for the daily summary of hourly data for all parameters at a site or sites, but it can also be used to report any time range or average interval. Statistics (Average, Maximum, Minimum, and Count) are at the bottom of each column.

To generate a **Daily Summary Report** (**Reports > Daily Summary Report**), select **Start** and **End Dates**, an **Average Interval**, **Site Name o**r Names, and **Parameter Name** or Names. Click the **Generate Report icon** on the Ribbon.

Current Time: 3/9/2009 2:18:57 PM

Daily Summary Report

Site: SITEONE 9/1/2007 Interval 001h

Hour	AMBTEMI	OZONE	RAINFALL	RELHUM	RWDR	RWSP	SIGTHET	SOLARRA	SWSP
00:00	13.5	78	0	99	126	4.4	9	0	4.4
01:00	13.6	78	0	99	122	4.5	10	0	4.5
02:00	13.5	83	0	98	136	4.5	8	0	4.5
03:00	13.8	88	0	100	143	3.9	8	0	3.9
04:00	13.8	87	0	100	125	3.6	10	0	3.6
05:00	13.5	86	0	100	110	3.2	10	0	3.2
06:00	13.4	83	0	100	110	3	9	36	3
07:00	14	79	0	100	103	2.7	13	193	2.7
08:00	14	78	0	98	101	2.9	12	259	2.9
09:00	14	73	0	98	102	2.2	16	157	2.2
10:00	14.9	68	0	94	110	2.5	18	345	2.5
11:00	15.5	64	0	91	121	2.2	22	357	2.2
Average	13.958	79.75		98.083	117.417	3.3	12.083	112.25	3.3
Max	15.5	88	0	100	143	4.5	22	357	4.5
Min	13.4	64	0	91	101	2.2	8	0	2.2
Count	12	12	12	12	12	12	12	12	12

Daily Summary Report

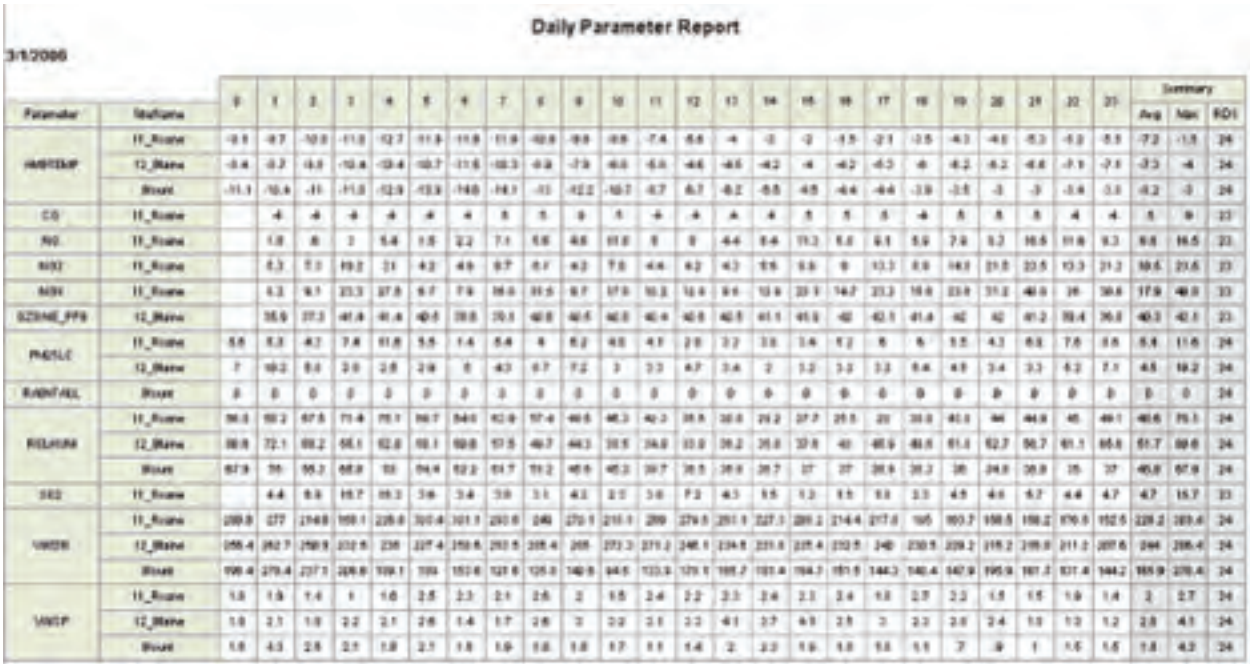
Basic Reports

Daily Parameter Report

The **Daily Parameter Report** shows a single day summary for the entire monitoring network, grouping parameters together by the Parameter Template, but showing all sites sharing that parameter template.

Parameters that do not have a parameter template designated are not reported.

To generate a **Daily Parameter Report** (**Reports > Daily Parameter Report**), select **Start** and **End Dates**, an **Average Interval**, **Site Name o**r Names, and **Parameter Name** or Names. Click the **Generate Report icon** on the Ribbon.



Daily Parameter Report

3/1/2000

Parameter	Statistic	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary Avg	Summary Max	Summary RDI
[illegible]	11_Rolling	-9.9	-9.7	-10.0	-11.0	-12.7	-11.9	-11.9	-11.9	-12.0	-9.9	-9.8	-7.4	-5.6	-4	-2	-2	-1.5	-2.1	-2.5	-4.1	-4.0	-5.3	-5.3	-5.5	-7.2	-1.5	24
	12_Raw	-5.4	-5.2	-5.0	-10.4	-13.4	-10.7	-11.6	-10.3	-5.8	-7.9	-6.0	-5.0	-4.6	-4.6	-4.2	-4	-4.2	-5.3	-6	-6.2	-6.2	-6.8	-7.1	-7.1	-7.3	-4	24
	Blank	-11.1	-10.4	-11	-11.3	-12.9	-13.3	-14.0	-14.1	-11	-12.2	-10.7	-5.7	-5.7	-5.2	-5.5	-4.5	-4.4	-4.4	-3.9	-3.5	-3	-3	-3.4	-3.3	-5.2	-3	24
CO	11_Rolling		-4	-4	-4	-4	-4	-4	5	5	5	5	-4	-4	-4	-4	5	5	5	-4	5	5	5	-4	-4	5	9	33
NO	11_Rolling		1.8	8	2	5.4	1.5	2.2	7.1	5.5	4.5	11.5	5	9	-4.4	5.4	11.2	5.5	6.1	5.9	7.9	5.2	10.5	11.9	9.3	9.5	16.5	33
NO2	11_Rolling		5.3	7.1	19.2	21	4.2	4.9	9.7	5.1	4.2	7.5	4.4	4.2	4.3	5.5	5.5	5	13.3	5.9	14.3	21.5	23.5	13.3	21.2	19.5	21.5	33
NOX	11_Rolling		5.3	9.1	23.3	27.5	5.7	7.9	16.5	10.5	5.7	17.5	10.3	12.4	9.5	13.9	23.3	14.7	23.3	15.5	23.9	31.2	46.5	25	30.5	17.9	46.5	33
OZONE_PPB	12_Raw		35.9	37.3	41.4	41.4	40.5	39.5	39.3	40.5	40.5	40.5	40.4	40.5	40.5	41.1	41.5	42	42.1	41.4	42	42	41.2	39.4	36.5	40.3	42.1	33
PM25LC	11_Rolling	5.5	5.3	4.7	7.4	11.5	5.5	1.4	5.4	4	5.2	4.5	4.1	2.5	3.2	3.5	3.4	5.2	5	5	5.5	4.3	5.5	7.5	5.5	5.4	11.5	24
	12_Raw	7	10.2	5.5	3.5	2.5	2.5	5	4.3	5.7	7.2	3	3.3	4.7	3.4	2	3.2	3.3	3.3	5.4	4.5	3.4	3.3	5.2	7.1	4.5	10.2	24
RAINFALL	Blank	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
RELHUM	11_Rolling	56.5	59.2	57.5	71.4	75.1	59.7	54.5	52.9	57.4	49.5	46.3	42.2	35.5	32.5	29.2	27.7	25.5	23	33.5	43.5	44	44.9	45	49.1	40.6	75.1	24
	12_Raw	58.9	72.1	69.2	55.1	62.5	58.1	59.5	57.5	49.7	44.3	33.5	34.5	33.5	35.2	35.5	33.5	40	45.9	46.5	51.1	52.7	50.7	51.1	65.5	51.7	59.5	24
	Blank	57.9	55	55.2	65.5	53	54.4	52.2	51.7	51.2	45.5	45.3	39.7	35.5	35.5	35.7	37	37	35.5	35.2	35	34.5	35.5	35	37	45.5	57.9	24
SR2	11_Rolling		4.4	5.5	15.7	15.3	3.5	3.4	3.5	3.1	4.2	2.5	3.5	7.2	4.3	5.5	5.3	5.5	5.5	3.3	4.5	4.5	5.7	4.4	4.7	4.7	15.7	33
WDIR	11_Rolling	259.5	277	274.5	159.1	225.5	310.4	101.1	250.5	245	270.1	211.1	259	279.5	251.1	227.1	209.2	214.4	217.5	195	160.7	158.5	158.2	170.5	152.5	229.2	283.4	24
	12_Raw	255.4	262.7	258.5	232.5	235	227.4	250.5	252.5	235.4	205	272.3	271.2	248.1	234.5	231.5	225.4	232.5	240	230.5	229.2	215.2	215.5	211.2	207.5	244	286.4	24
	Blank	190.4	279.4	237.1	226.5	159.1	159	152.5	121.5	125.5	140.5	94.5	122.5	170.1	195.7	151.4	154.7	151.5	144.2	140.4	147.5	195.5	167.7	121.4	144.2	165.5	279.4	24
WSP	11_Rolling	1.5	1.5	1.4	1	1.5	2.5	2.2	2.1	2.5	2	1.5	2.4	2.2	2.2	2.4	2.2	2.4	1.5	2.7	2.2	1.5	1.5	1.5	1.4	2	2.7	24
	12_Raw	1.5	2.1	1.5	2.2	2.1	2.5	1.4	1.7	2.5	2	2.2	2.1	2.2	4.1	2.7	4.1	2.5	2	2.2	2.5	2.4	1.5	1.2	1.2	2.5	4.1	24
	Blank	1.5	4.5	2.5	2.1	1.5	2.1	1.5	1.5	1.5	1.5	1.7	1.1	1.4	2	2.2	1.5	1.5	1.5	1.1	2	5	1	1.5	1.5	1.5	4.5	24

Basic Reports

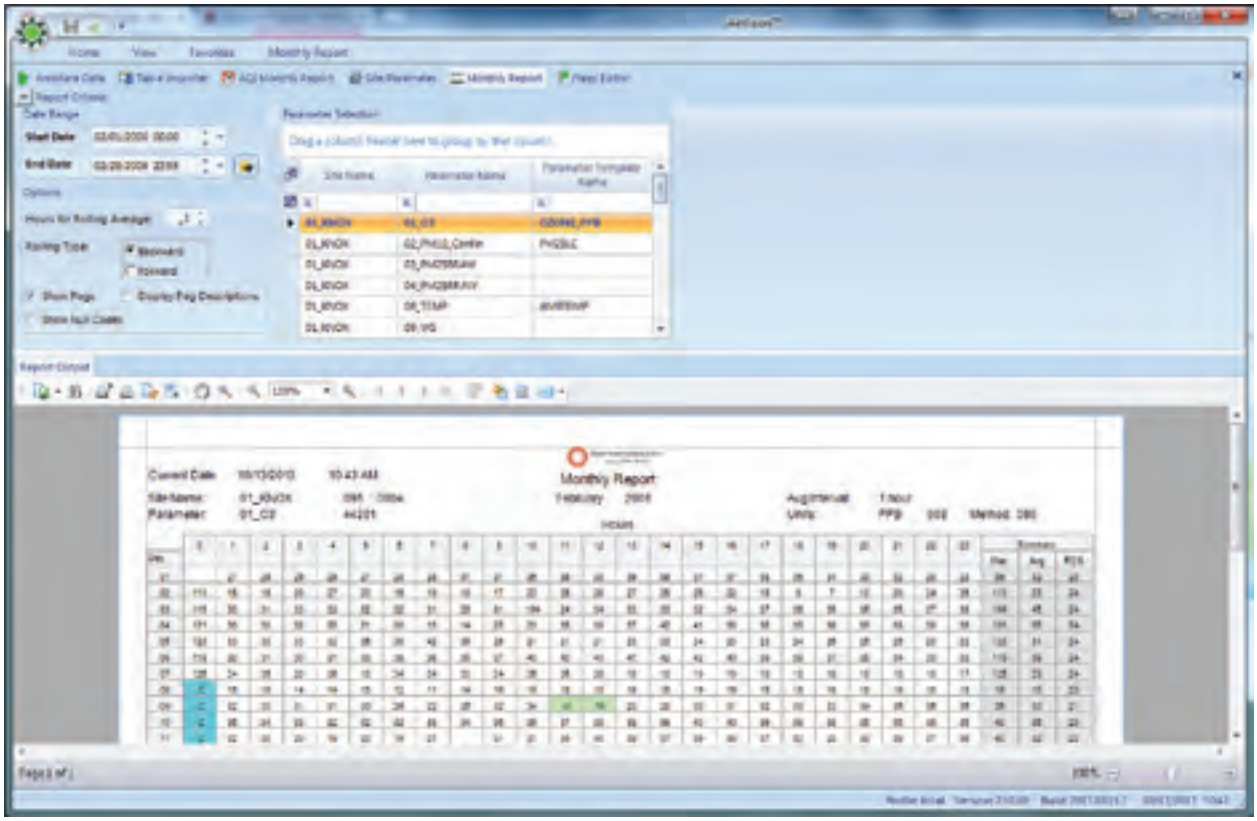
Monthly Report

Monthly reports provide a matrix view of a single parameter, showing values for the entire month. Invalid or flagged data is shown with a color background or font change defining the data condition. Statistics are provided for each row (day) and column (hour).

To run a **Monthly Report:**

1. Select **Reports > Monthly Report.**
2. Select a **Start** and **End** date
3. Select number of **Hours for Rolling Average**
4. Select a **Rolling Type** (**Backward or Forward**)
5. Select the **Parameters** that will be displayed in the report
6. If you want the **Flags Legend** to be shown in the report, click to select **Flags**. (You may have to scroll down to see the Flags option.
7. Click the **Generate Report** button on the Ribbon.

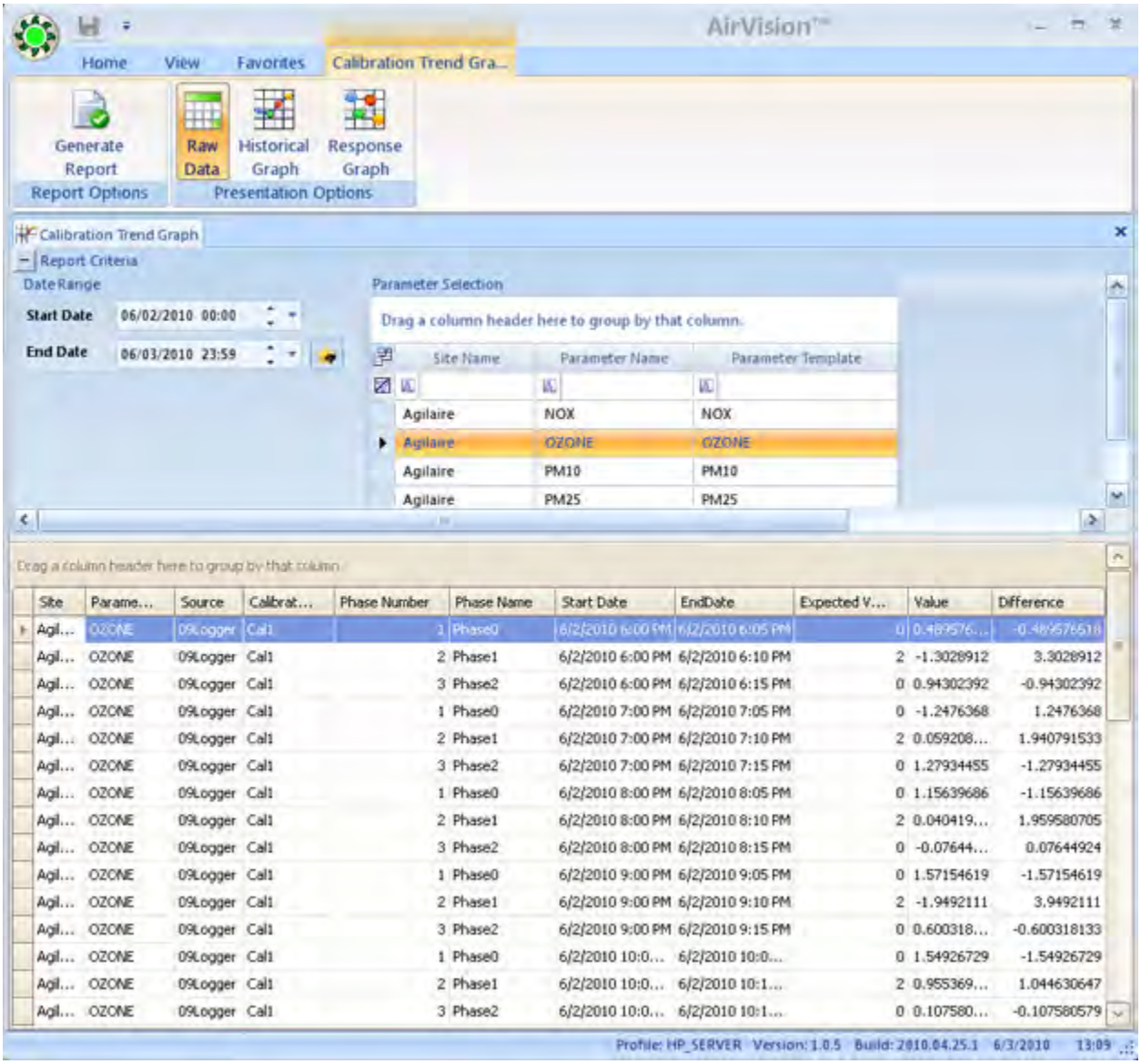
▶ **Note:** If **Totalize in Reports** was selected in **Configuration Editors > Parameter Settings**, Monthly Reports will show a total of data rather than an average. If **Minimum in Reports** was this option was selected in **Configuration Editors > Parameter Settings**, Monthly Reports will show a minimum of data rather than an average or a total. Totalize in Reports and Minimum in Reports are most commonly used for rainfall.



Monthly Report with Parameter Code

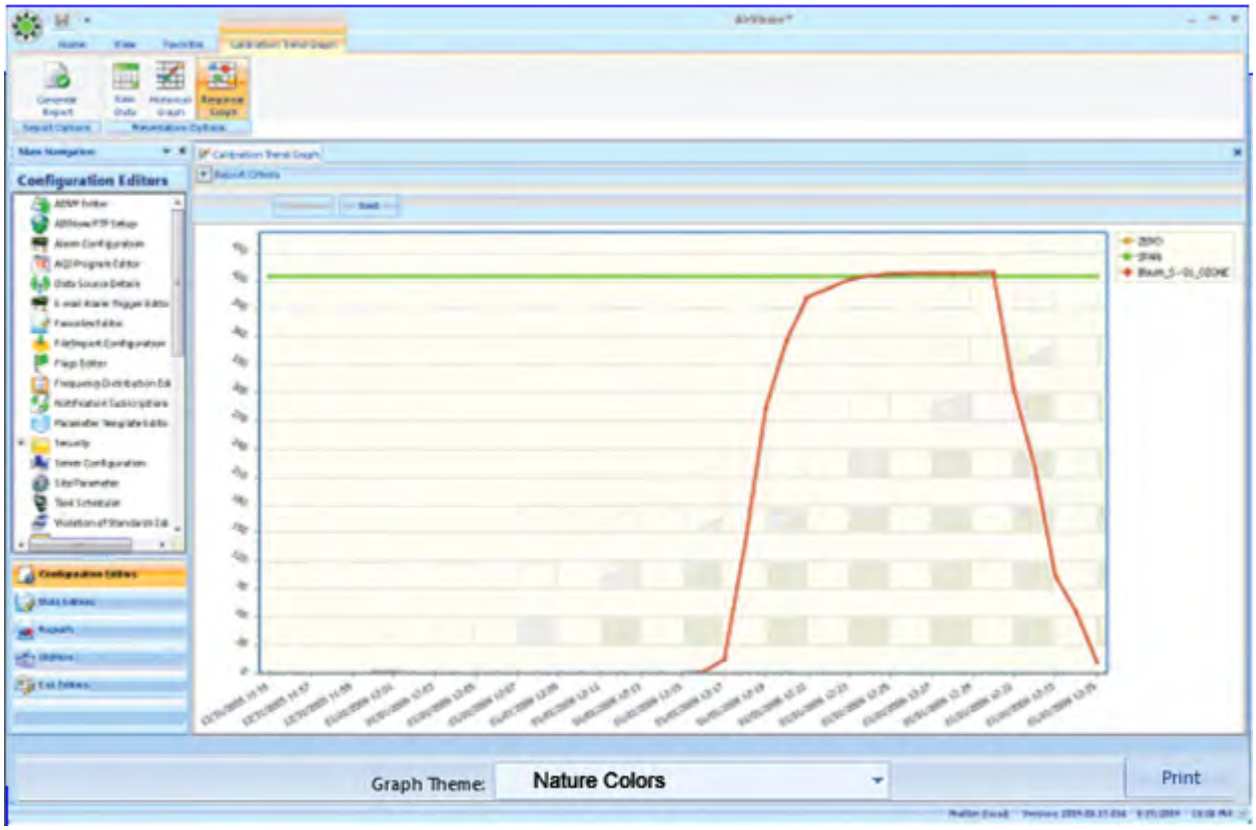
If **AQS Null Code**s have been set for invalidated data, they are displayed in the **Monthly Repor**t. If Site Codes, and/or Parameter codes have been selected in the Configuration Menu they will be included in the Header. Options are provided to show null codes or flags when an invalid hour is shown on the report. These options are also available in the Scheduled Task (options).

If you select **Historical Graph** from the Ribbon, you can view data in a graph. Each color represents a different phase, as shown in the legend. You can change the color scheme by selecting a **Graph Theme** from the drop down list at the bottom of the screen.


AirVision
Home
View
Favorites
Calibration Trend Gra...
Generate Report
Report Options
Raw Data
Historical Graph
Response Graph
Presentation Options
Calibration Trend Graph
Report Criteria
Date Range
Start Date
06/02/2010 00:00
End Date
06/03/2010 23:59
Parameter Selection
Drag a column header here to group by that column.
Site Name
Parameter Name
Parameter Template
Agilaire NOX NOX
Agilaire OZONE OZONE
Agilaire PM10 PM10
Agilaire PM25 PM25
Drag a column header here to group by that column
Site
Parame...
Source
Calibrat...
Phase Number
Phase Name
Start Date
EndDate
Expected V...
Value
Difference
Agil... OZONE 09Logger Cal1 1 Phase0 6/2/2010 6:00 PM 6/2/2010 6:05 PM 0 0.489576... -0.489576518
Agil... OZONE 09Logger Cal1 2 Phase1 6/2/2010 6:00 PM 6/2/2010 6:10 PM 2 -1.3028912 3.3028912
Agil... OZONE 09Logger Cal1 3 Phase2 6/2/2010 6:00 PM 6/2/2010 6:15 PM 0 0.94302392 -0.94302392
Agil... OZONE 09Logger Cal1 1 Phase0 6/2/2010 7:00 PM 6/2/2010 7:05 PM 0 -1.2476368 1.2476368
Agil... OZONE 09Logger Cal1 2 Phase1 6/2/2010 7:00 PM 6/2/2010 7:10 PM 2 0.059208... 1.940791533
Agil... OZONE 09Logger Cal1 3 Phase2 6/2/2010 7:00 PM 6/2/2010 7:15 PM 0 1.27934455 -1.27934455
Agil... OZONE 09Logger Cal1 1 Phase0 6/2/2010 8:00 PM 6/2/2010 8:05 PM 0 1.15639686 -1.15639686
Agil... OZONE 09Logger Cal1 2 Phase1 6/2/2010 8:00 PM 6/2/2010 8:10 PM 2 0.040419... 1.959580705
Agil... OZONE 09Logger Cal1 3 Phase2 6/2/2010 8:00 PM 6/2/2010 8:15 PM 0 -0.07644... 0.07644924
Agil... OZONE 09Logger Cal1 1 Phase0 6/2/2010 9:00 PM 6/2/2010 9:05 PM 0 1.57154619 -1.57154619
Agil... OZONE 09Logger Cal1 2 Phase1 6/2/2010 9:00 PM 6/2/2010 9:10 PM 2 -1.9492111 3.9492111
Agil... OZONE 09Logger Cal1 3 Phase2 6/2/2010 9:00 PM 6/2/2010 9:15 PM 0 0.600318... -0.600318133
Agil... OZONE 09Logger Cal1 1 Phase0 6/2/2010 10:0... 6/2/2010 10:0... 0 1.54926729 -1.54926729
Agil... OZONE 09Logger Cal1 2 Phase1 6/2/2010 10:0... 6/2/2010 10:1... 2 0.955369... 1.044630647
Agil... OZONE 09Logger Cal1 3 Phase2 6/2/2010 10:0... 6/2/2010 10:1... 0 0.107580... -0.107580579
Profile: HP_SERVER Version: 1.0.5 Build: 2010.04.25.1 6/3/2010 13:09

Historical Calibration Trend Graph

If you select **Response Graph** from the Ribbon at the top of the screen, you can review fine-resolution data during each calibration cycle to see instrument response. Each cal can be cycled through using the **Forward**/**Back** button. You can change the color scheme by selecting a **Graph Theme** from the drop down list at the bottom of the screen.



Calibration Trend Response Graph

Current Date: 10/18/2010 12:51 PM
Site Name: Agilaire
Parameter: OZONE

Monthly Report
October 2010

Avg Interval: 1 hour
Units: PPM

Hours

Day	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Summary Avg	Summary Max	RDS
01	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	0.005	0.005	24
02	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	0.005	0.005	24
03	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	0.005	0.005	24
04	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	1.676 D	3.534	3.547	0.359	3.547	24
05	3.581	3.574	3.587	3.597	3.609	3.618	3.629	3.639	3.626 >	3.556	3.533	3.526	3.527	3.522	3.518	3.522	3.52	3.518	3.505	3.502	3.51	3.531	3.533	3.547	3.552	3.638	24
06	3.582	3.576	3.586	3.597	3.611	3.62	3.629	3.638	3.635	3.598	3.621	3.524	3.542	3.552	3.555 +	3.555	3.551	3.544	3.533	3.536	3.546	3.556	3.571	3.571	3.638	23
07	3.583	3.598	3.61	3.62	3.632	3.641	3.653	3.665	3.657	3.657	3.566	3.56	3.557	3.542	3.53	3.525	3.52	3.523	3.523	3.513	3.511	3.526	3.512	3.522	3.572	3.666	24
08	3.53	3.541	3.55	3.56	3.57	3.58	3.599	3.6	3.594	3.54	3.5	3.493	3.493	3.493	3.491	3.491	3.485	3.486	3.489	3.478	3.474	3.481	3.487	3.497	3.518	3.599	23
09	3.507	3.519	3.6	3.542	3.549	3.558	3.563	3.574	3.578	3.557	3.518	3.492	3.488	3.496	3.496	3.496	3.499	3.495	3.492	3.488	3.479	3.481	3.46	3.483	3.514	3.578	23
10	3.492	3.498	3.507	3.516	3.524	3.53	3.539	3.545	3.547	3.527	3.492	3.48	3.497	3.517	3.519	3.522	3.522	3.519	3.515	3.514	3.503	3.501	3.51	3.516	3.515	3.547	24
11	3.527	3.535	3.543	3.554	3.565	3.573	3.582	3.591	3.594	3.562	3.541	3.54	3.533	3.534	3.535	3.531	3.533	3.533	3.529	3.527	3.527	3.522	3.531	3.534	3.544	3.594	24
12	3.539	3.548	3.552	3.561	3.567	3.578	3.582	3.589	3.591	3.577	3.554	3.539	3.538	3.543	3.538	3.531	3.533	3.524	3.521	3.523	3.516	3.517	3.521	3.521	3.546	3.591	24
13	3.527	3.525	3.524	3.527	3.533	3.538	3.538	3.542	3.539	3.529	3.529	3.531	3.526	3.527	3.526	1.993 D	.003	.003	.003	.003	.003	.003	.003	.003	2.327	3.542	24
14	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	0.003	0.003	24
15	.003	.003	.003	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	0.003	0.004	24
16	.003	.003	.003	.003	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	0.003	0.004	24
17	.003	.003	.003	.003	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	0.003	0.004	24
18	.003	.003	.003	.003	.003	.003	.003	.003 >	.003	.003	.003														0.003	0.003	11
Max	3.583	3.598	3.61	3.62	3.632	3.641	3.653	3.665	3.657	3.657	3.566	3.56	3.557	3.542	3.552	3.555	3.555	3.551	3.544	3.533	3.536	3.546	3.556	3.57	3.665	3.665	3.665
Avg	1.77	1.774	1.676	1.783	1.799	1.792	1.797	1.805	1.788	1.786	1.662	1.666	1.665	1.667	1.667	1.528	1.659	1.656	1.656	1.663	1.662	1.751	1.664	1.668	1.786	1.786	1.786
Count	18	18	17	18	18	18	18	17	18	18	17	17	17	17	17	17	17	17	17	17	17	17	17	17	416	416	416

Monthly Report

Flags

>	Some Data Missing	+	Max Exceeded	-	Min Exceeded	<	Logger Invalid
?	Suspect	a	Audit	B	Bad Status	C	Calibration
c	Ceiling Limit	D	Channel Disabled	E	Edited	e	Site Malfunction
f	Floor Limit	H	High-High Alarm	h	High Alarm	I	Invalidated By Edit
J	Rate of Change Alarm	L	Low-Low Alarm	l	Low Alarm	M	Maintenance
m	Marked Maint by edit	O	Overrange	o	Other	P	Power Failure
p	Precision Check	Q	Quality Assured	R	Rate of Change Exceeded	V	Dig Info#1
W	Dig Info#2	X	Dig Info#3	Y	Dig Info#4	Z	Dig Info#5
z	Zero Adjusted						

Flags Legend in Monthly Report

Calibration Reports

Calibration Results

Calibration Results show the calibration event and results for any zero/span, precision check, or other calibration program.

Current Date : 3/9/2009
Current Time : 3:47 PM

Calibration Report

Site: SITEONE
Source: Logger01
Date: 02-Jul-2008

Parameter	Sequence	Phase	Start Time	End Time	Value	Expected Value	% Error
test1	TESTCAL	PHASE1	00:00:00	00:01:00	1.123	1	12.35

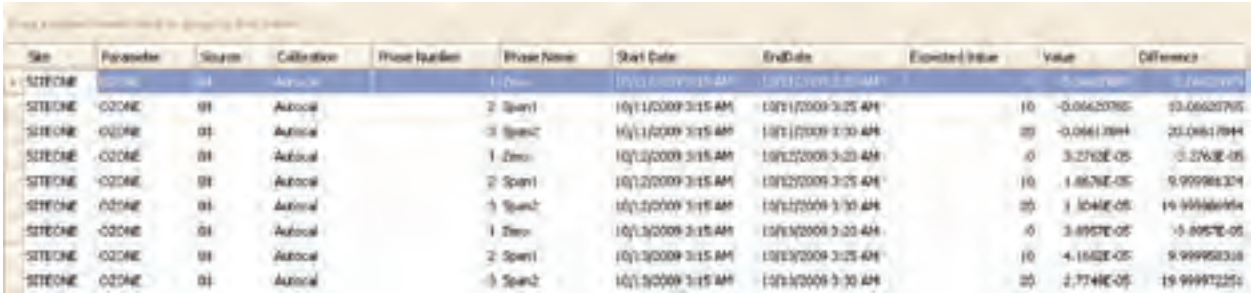
Calibration Report

Calibration Reports

Calibration Trend Graph

Calibration Trend Graphs provide a long-term view of calibration zero/span results over a user-defined period of time (month, quarter, etc). Select a **Start** and **End Date** and a **Parameter**. Click the **Generate Report** icon on the ribbon.

If you select **Raw Data Graph** from the ribbon at the top of the screen, you can view calibration data in a text table.



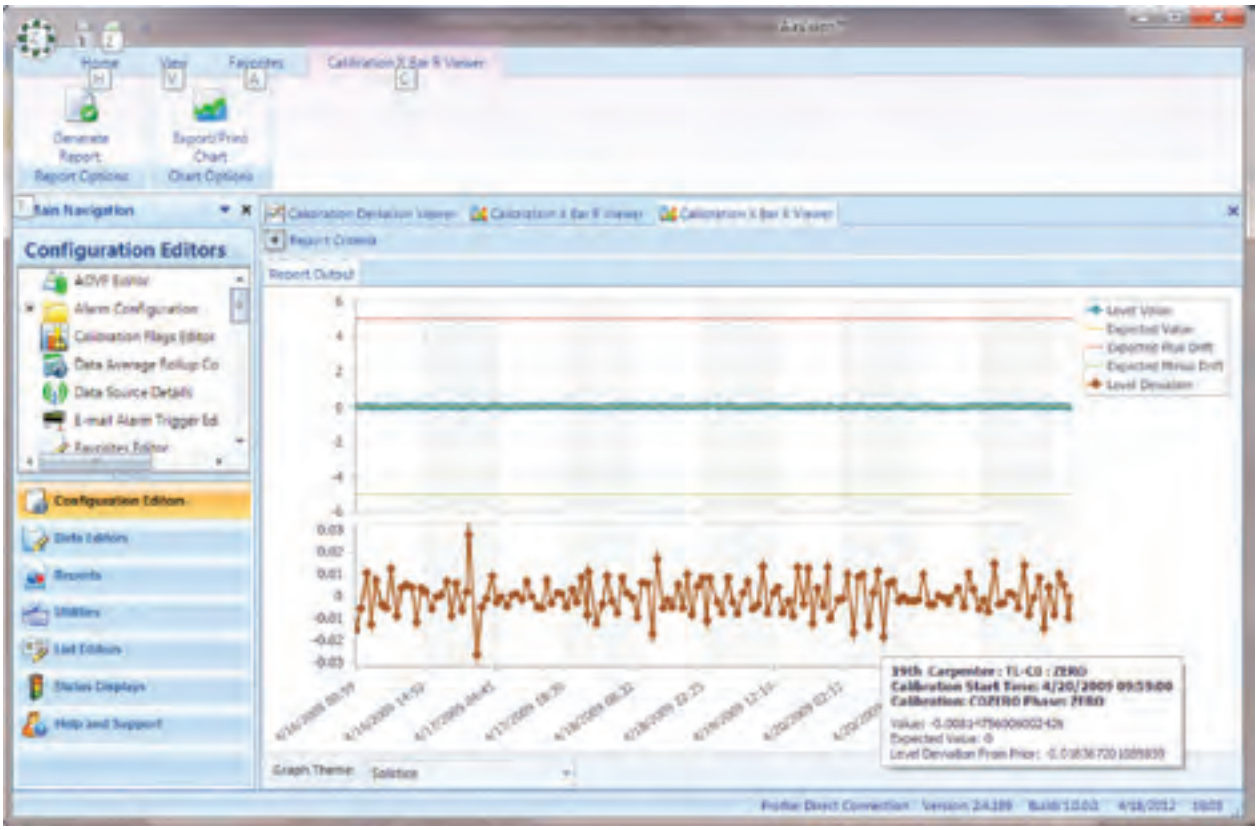
Site	Parameter	Source	Calibration	Phase Number	Phase Name	Start Date	End Date	Expected Value	Value	Difference
SITEONE	OZONE	01	Autocal	2	Span1	10/11/2009 3:15 AM	10/11/2009 3:25 AM	10	-0.066207935	10.066207935
SITEONE	OZONE	01	Autocal	3	Span2	10/11/2009 3:15 AM	10/11/2009 3:30 AM	20	-0.066178944	20.066178944
SITEONE	OZONE	01	Autocal	1	Zero	10/12/2009 3:15 AM	10/12/2009 3:20 AM	0	3.2762E-05	-3.2762E-05
SITEONE	OZONE	01	Autocal	2	Span1	10/12/2009 3:15 AM	10/12/2009 3:25 AM	10	1.8676E-05	9.999981324
SITEONE	OZONE	01	Autocal	3	Span2	10/12/2009 3:15 AM	10/12/2009 3:30 AM	20	1.3044E-05	19.99998696
SITEONE	OZONE	01	Autocal	1	Zero	10/13/2009 3:15 AM	10/13/2009 3:20 AM	0	3.6957E-05	-3.6957E-05
SITEONE	OZONE	01	Autocal	2	Span1	10/13/2009 3:15 AM	10/13/2009 3:25 AM	10	4.1682E-05	9.999958318
SITEONE	OZONE	01	Autocal	3	Span2	10/13/2009 3:15 AM	10/13/2009 3:30 AM	20	2.7748E-05	19.99997225

Raw Data Calibration Display

Calibration Reports

Calibration X-Bar-R Chart

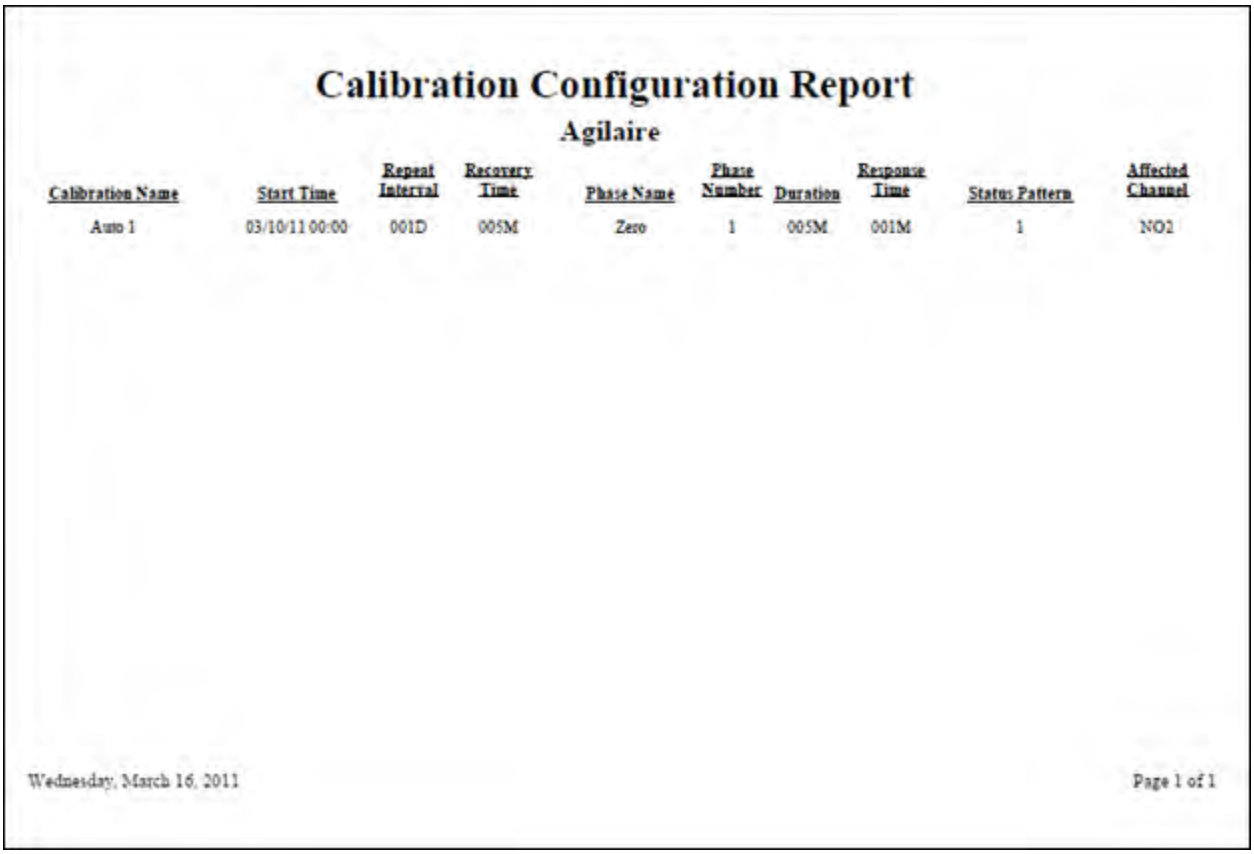
This chart provides a detailed review of a particular phase (e.g., zero, span, precision) for a particular parameter over time. The top chart shows the measured response and expected / reference value for each calibration event. If drift limits have been set, those bounds are shown as well. The bottom chart shows the value of the drift (difference) from one cal event to the next.



Configuration Reports

Calibration Configuration Report

To run a Calibration **Configuration Report** (**Reports > Configuration folder > Calibration Configuration Report**), select a site or sites and click the **Generate Report icon** on the Ribbon.



Calibration Configuration Report

Agilaire

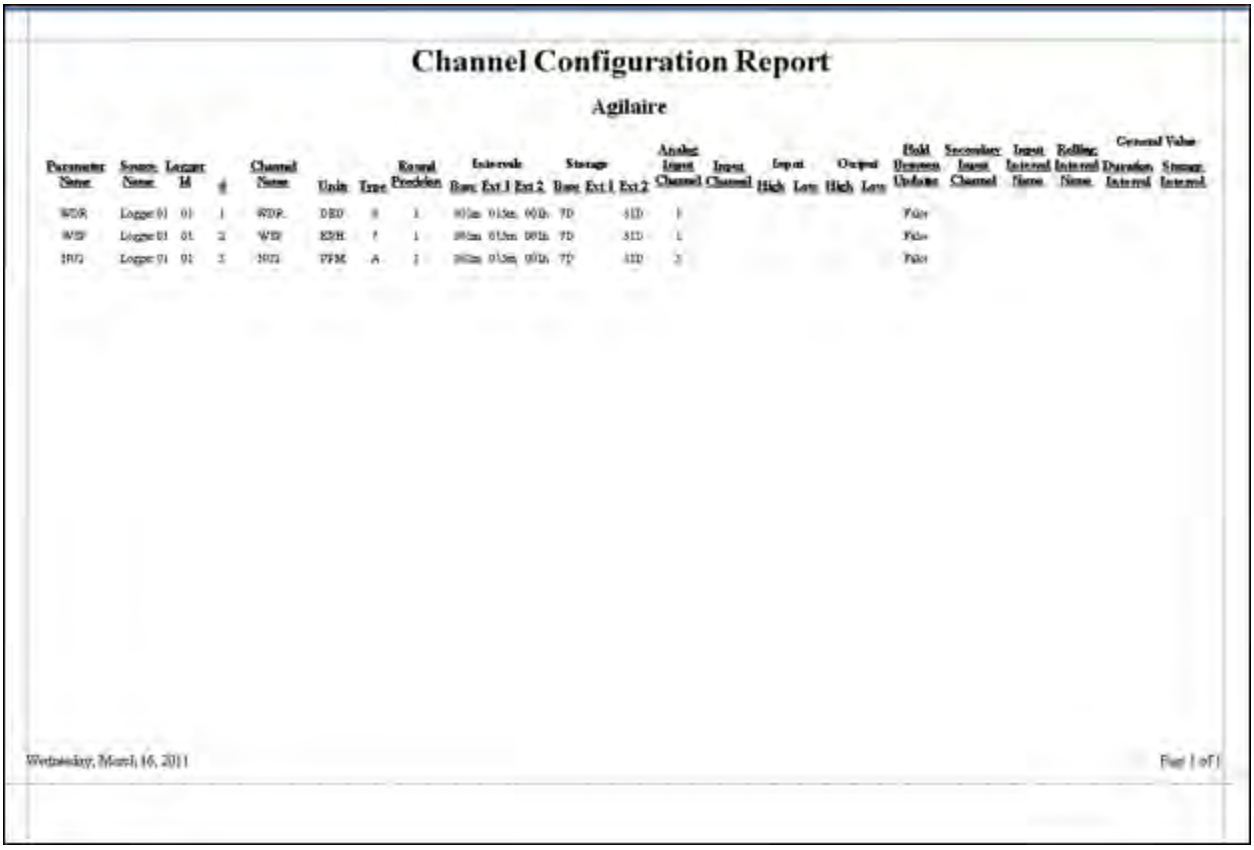
Calibration Name	Start Time	Repeat Interval	Recovery Time	Phase Name	Phase Number	Duration	Response Time	Status Pattern	Affected Channel
Auto 1	03/10/11 00:00	001D	005M	Zero	1	005M	001M	1	NO2

Wednesday, March 16, 2011 Page 1 of 1

Calibration Configuration Report (Reports > Configuration folder > Calibration Configuration Report)

Channel Configuration Report

To run a Channel Configuration Report (**Reports > Configuration folder > Channel Configuration Report**), select a **Site** or Sites and a **Parameter Name** or Parameter Names. Click the **Generate Report icon** on the Ribbon.



Channel Configuration Report

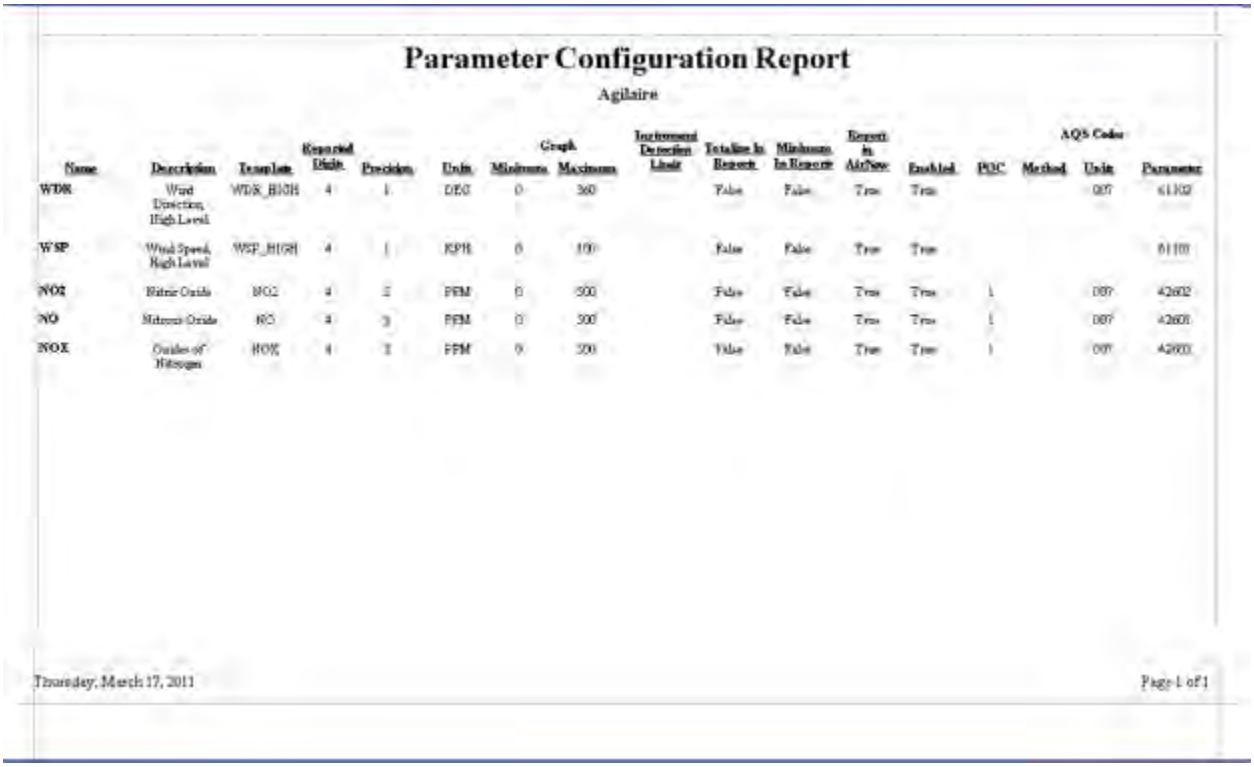
Agilaire

Parameter Name	Source Name	Logger Id	#	Channel Name	Units	Type	Record Precision	Intervals Base	Ext 1	Ext 2	Storage Base	Ext 1	Ext 2	Analog Input Channel	Input Channel	Input High	Input Low	Output High	Output Low	Hold Between Updates	Secondary Input Channel	Input Interval Name	Rolling Interval Name	General Value Duration Interval	General Value Storage Interval
WDR	Logger 01	01	1	WDR	DEG	0	1	01m	01m	60D	7D		52D	1						False					
WSP	Logger 01	01	2	WSP	KPH	1	1	01m	01m	90D	7D		52D	1						False					
BP2	Logger 01	01	3	BP2	PPM	A	1	01m	01m	90D	7D		52D	3						False					

Wednesday, March 16, 2011 Page 1 of 1

Parameter Configuration Report

To run a **Parameter Configuration Report**, (**Reports > Configuration folder > Parameter Configuration Report**), select a **Site** or Sites and a **Parameter Name** or Parameters Names. Click the **Generate Report icon** on the Ribbon.



Parameter Configuration Report

Agilaire

Name	Description	Template	Reported Digits	Precision	Units	Graph Minimum	Graph Maximum	Instrument Detection Limit	Totalize In Report	Minimum In Report	Report in AirNow	Enabled	POC	AQS Codes Method	AQS Codes Units	AQS Codes Parameter
WDR	Wind Direction, High Level	WDR_HIGH	4	1	DEG	0	360		False	False	True	True			007	61102
WSP	Wind Speed, High Level	WSP_HIGH	4	1	KPH	0	100		False	False	True	True				61100
NO2	Nitric Oxide	NO2	4	2	PPM	0	500		False	False	True	True	1		007	42602
NO	Nitrous Oxide	NO	4	3	PPM	0	500		False	False	True	True	1		007	42601
NOX	Oxides of Nitrogen	NOX	4	2	PPM	0	500		False	False	True	True	1		007	42603

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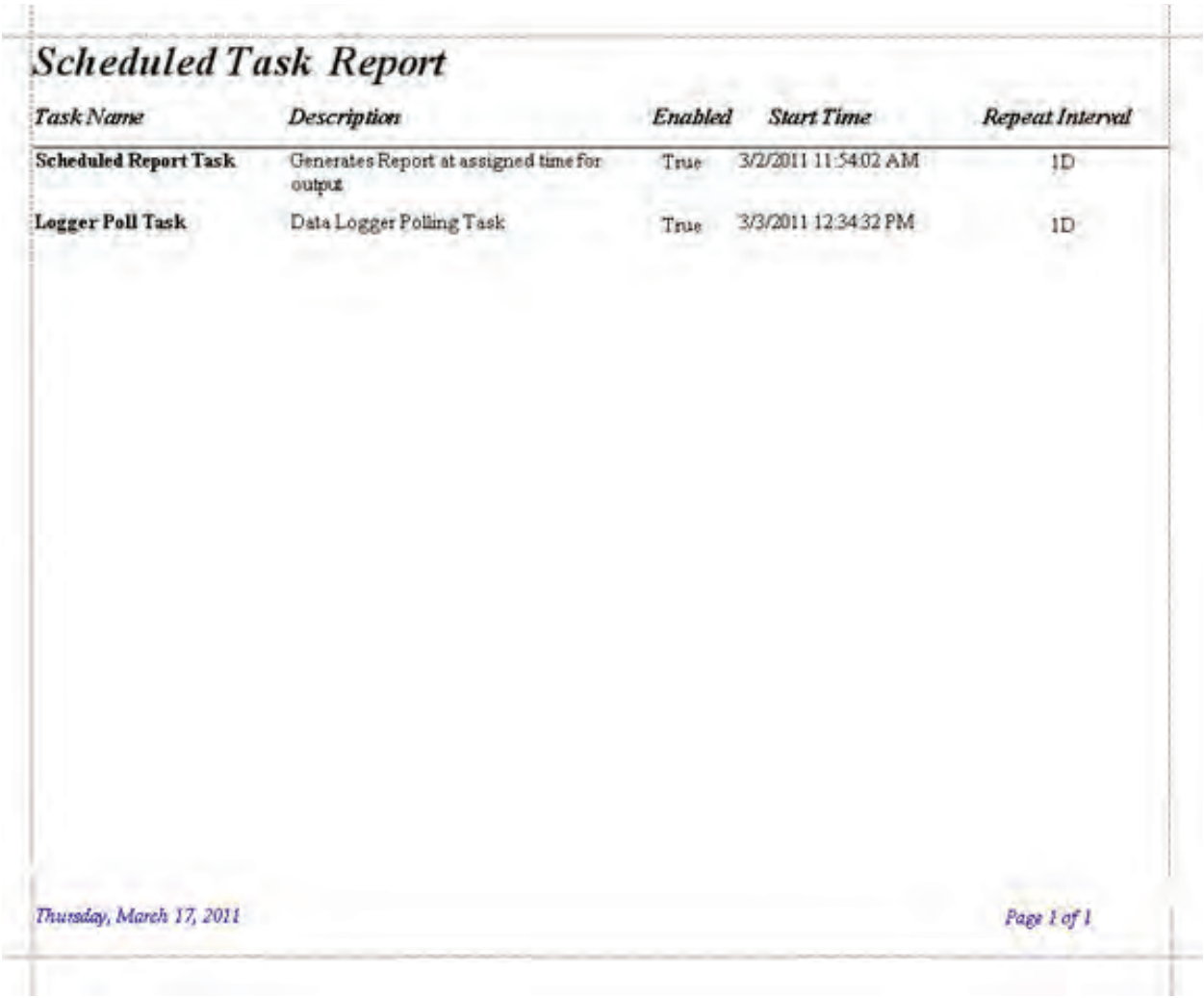
Parameter Configuration Report, (Reports > Configuration folder > Parameter Configuration Report)

Scheduled Tasks Report

To run a **Scheduled Tasks Report**, open **Reports > Configuration folder > Scheduled Tasks Report** and the report will be displayed automatically. No query is necessary.



Scheduled Task Report

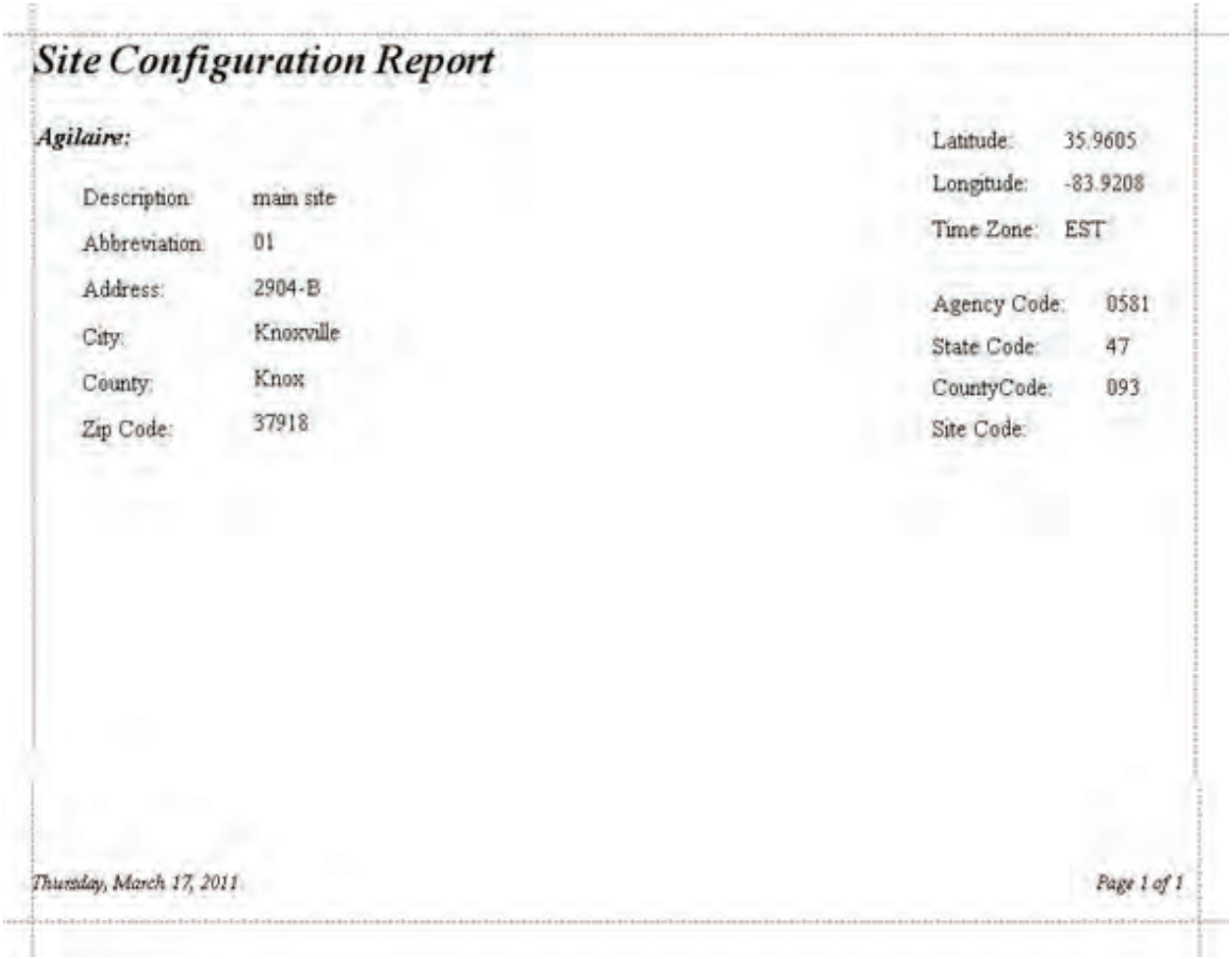
Task Name	Description	Enabled	Start Time	Repeat Interval
Scheduled Report Task	Generates Report at assigned time for output	True	3/2/2011 11:54:02 AM	1D
Logger Poll Task	Data Logger Polling Task	True	3/3/2011 12:34:32 PM	1D

Thursday, March 17, 2011 *Page 1 of 1*

Scheduled Task Report (Reports > Configuration folder > Scheduled Tasks Report)

Site Configuration Report

To run a **Site Configuration Report**, (**Reports > Configuration folder > Site Configuration Report**), select a **Site** or Sites and click the **Generate Report icon** on the Ribbon.



Site Configuration Report

Agilaire:

Description:	main site
Abbreviation:	01
Address:	2904-B
City:	Knoxville
County:	Knox
Zip Code:	37918

Latitude:	35.9605
Longitude:	-83.9208
Time Zone:	EST
Agency Code:	0581
State Code:	47
CountyCode:	093
Site Code:	

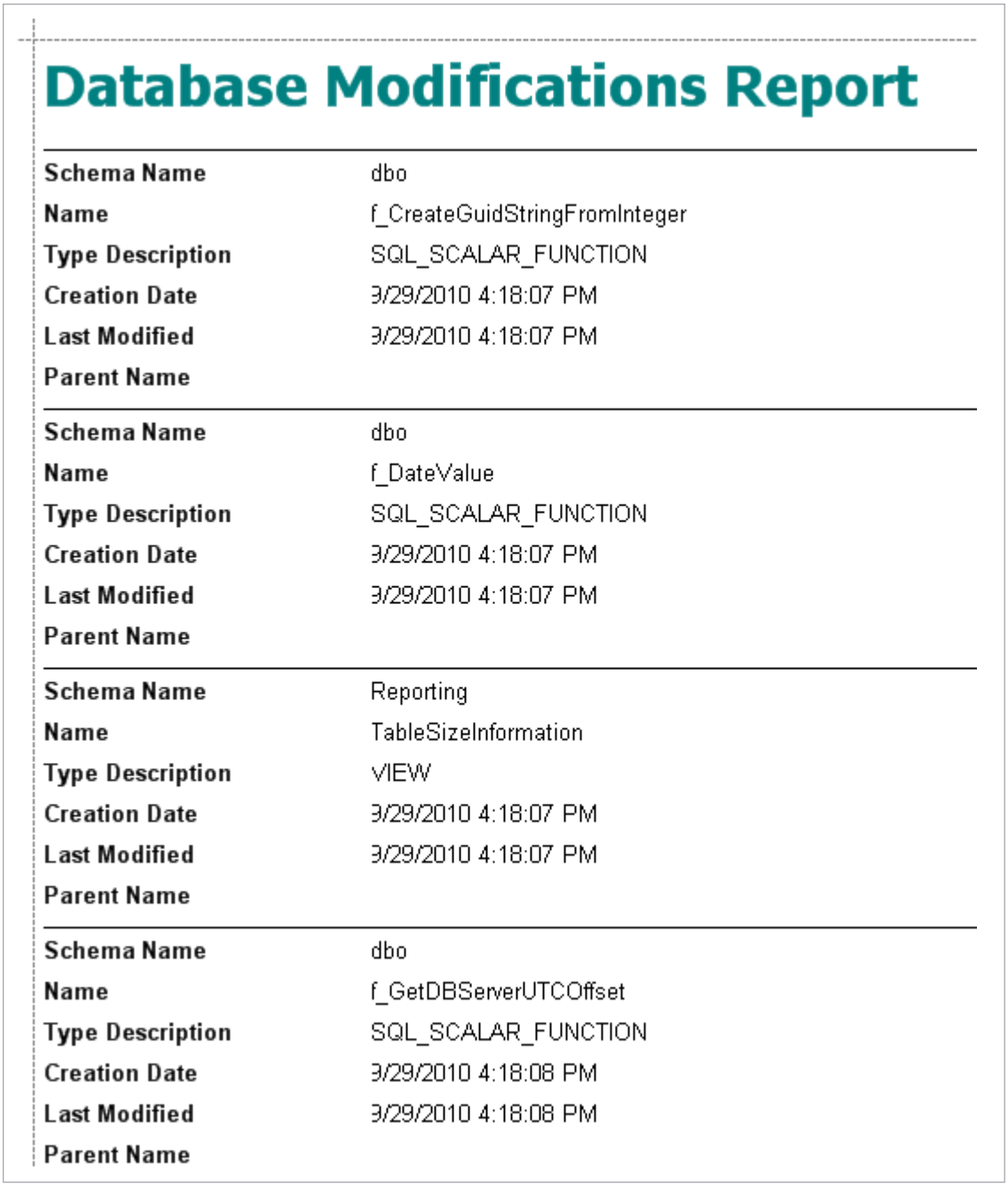
Thursday, March 17, 2011 *Page 1 of 1*

Site Configuration Report, (Reports > Configuration folder > Site Configuration Report)

Internal Reports

DB Modification History

The **Database Modifications Report** lists all modifications that were made to the AirVision database by Agilaire.



Database Modifications Report

Schema Name	dbo
Name	f_CreateGuidStringFromInteger
Type Description	SQL_SCALAR_FUNCTION
Creation Date	3/29/2010 4:18:07 PM
Last Modified	3/29/2010 4:18:07 PM
Parent Name	

Schema Name	dbo
Name	f_DateValue
Type Description	SQL_SCALAR_FUNCTION
Creation Date	3/29/2010 4:18:07 PM
Last Modified	3/29/2010 4:18:07 PM
Parent Name	

Schema Name	Reporting
Name	TableSizeInformation
Type Description	VIEW
Creation Date	3/29/2010 4:18:07 PM
Last Modified	3/29/2010 4:18:07 PM
Parent Name	

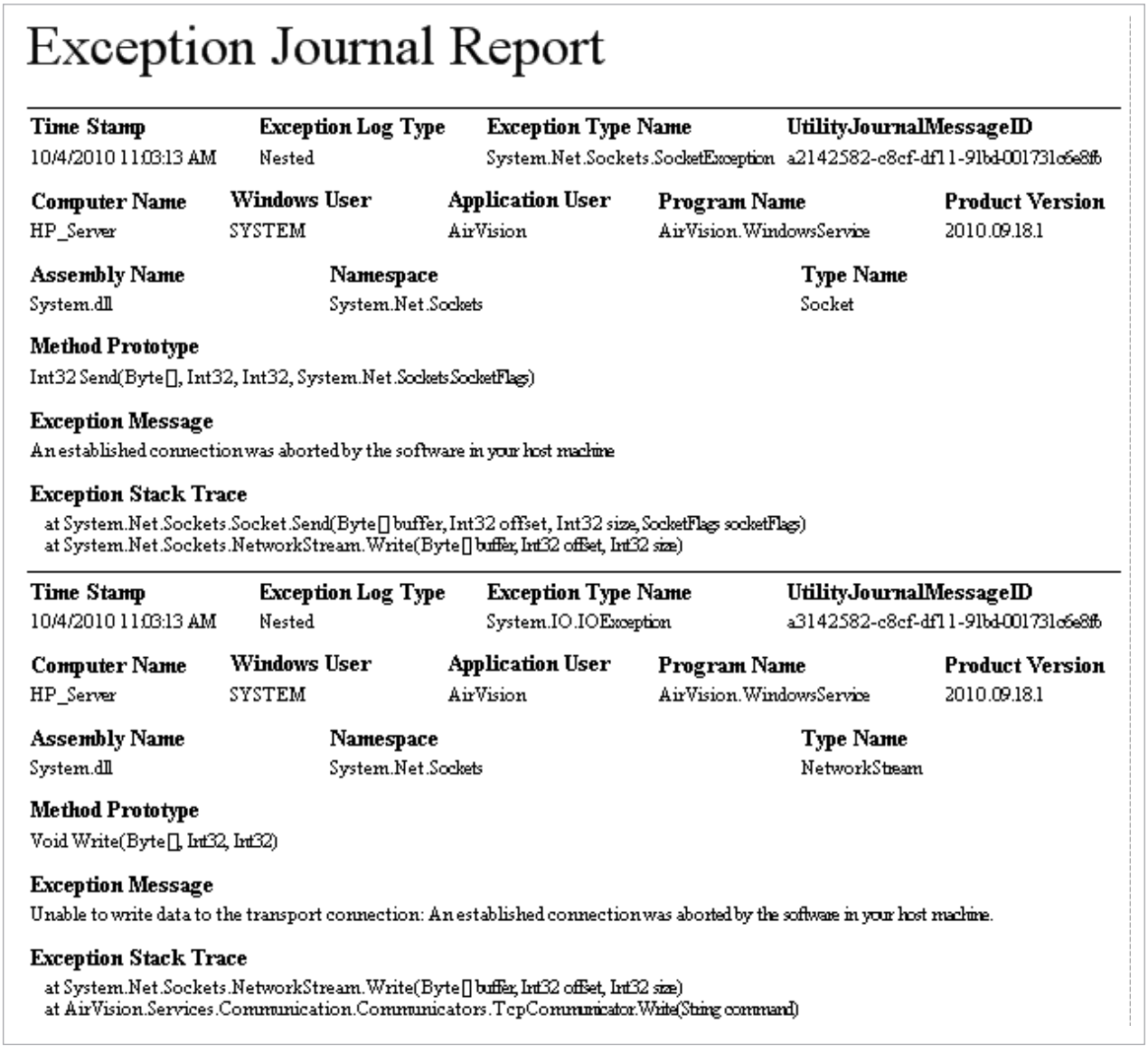
Schema Name	dbo
Name	f_GetDBServerUTCOffset
Type Description	SQL_SCALAR_FUNCTION
Creation Date	3/29/2010 4:18:08 PM
Last Modified	3/29/2010 4:18:08 PM
Parent Name	

Database Modification History Report (Reports>Internal Reports>DB Modification History)

Internal Reports

Exception Journal Report

The **Exception Journal Report** displays all AirVision Exception messages for the Date Range and Logging Type selected. Logging Types are selected from a drop-down list of the following: **Unhandled**, **Nested**, **Rethrown**, **Asset**, and **Validation**.



Exception Journal Report

Time Stamp	Exception Log Type	Exception Type Name	UtilityJournalMessageID
10/4/2010 11:03:13 AM	Nested	System.Net.Sockets.SocketException	a2142582-c8cf-df11-91bd-001731c6e8fb

Computer Name	Windows User	Application User	Program Name	Product Version
HP_Server	SYSTEM	AirVision	AirVision.WindowsService	2010.09.18.1

Assembly Name	Namespace	Type Name
System.dll	System.Net.Sockets	Socket

Method Prototype

Int32 Send(Byte[], Int32, Int32, System.Net.SocketsSocketFlags)

Exception Message

An established connection was aborted by the software in your host machine

Exception Stack Trace

at System.Net.Sockets.Socket.Send(Byte[] buffer, Int32 offset, Int32 size, SocketFlags socketFlags)
at System.Net.Sockets.NetworkStream.Write(Byte[] buffer, Int32 offset, Int32 size)

Time Stamp	Exception Log Type	Exception Type Name	UtilityJournalMessageID
10/4/2010 11:03:13 AM	Nested	System.IO.IOException	a3142582-c8cf-df11-91bd-001731c6e8fb

Computer Name	Windows User	Application User	Program Name	Product Version
HP_Server	SYSTEM	AirVision	AirVision.WindowsService	2010.09.18.1

Assembly Name	Namespace	Type Name
System.dll	System.Net.Sockets	NetworkStream

Method Prototype

Void Write(Byte[], Int32, Int32)

Exception Message

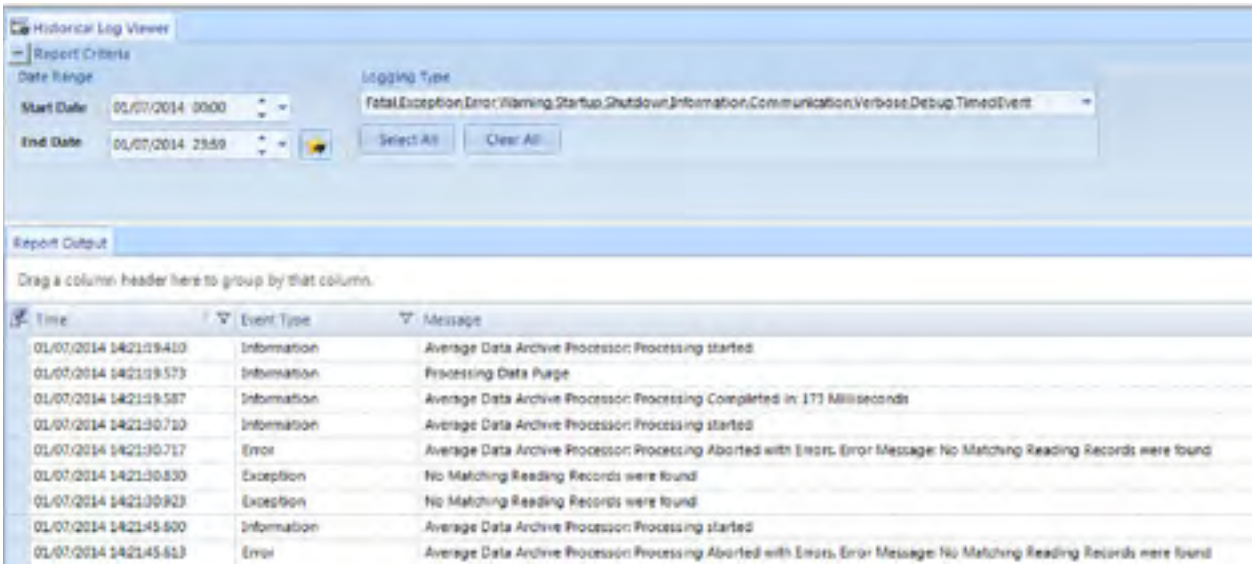
Unable to write data to the transport connection: An established connection was aborted by the software in your host machine.

Exception Stack Trace

at System.Net.Sockets.NetworkStream.Write(Byte[] buffer, Int32 offset, Int32 size)
at AirVision.Services.Communication.Communicators.TcpCommunicator.Write(String command)

Internal Reports

Historical Log Viewer

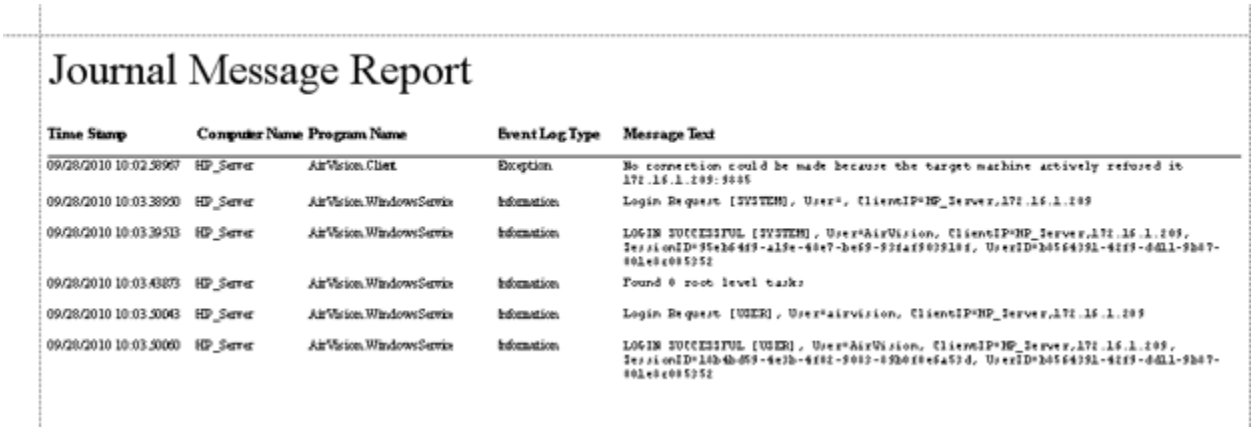

Historical Log Viewer
Report Criteria
Date Range
Start Date 01/07/2014 00:00
End Date 01/07/2014 23:59
Logging Type
Fatal,Exception,Error,Warning,Startup,Shutdown,Information,Communication,Verbose,Debug,TimedEvent
Select All
Clear All
Report Output
Drag a column header here to group by that column.
Time
Event Type
Message
01/07/2014 14:21:19.410 Information Average Data Archive Processor: Processing started
01/07/2014 14:21:19.573 Information Processing Data Purge
01/07/2014 14:21:19.587 Information Average Data Archive Processor: Processing Completed in: 177 Milliseconds
01/07/2014 14:21:30.710 Information Average Data Archive Processor: Processing started
01/07/2014 14:21:30.717 Error Average Data Archive Processor: Processing Aborted with Errors. Error Message: No Matching Reading Records were found
01/07/2014 14:21:30.830 Exception No Matching Reading Records were found
01/07/2014 14:21:30.923 Exception No Matching Reading Records were found
01/07/2014 14:21:45.600 Information Average Data Archive Processor: Processing started
01/07/2014 14:21:45.613 Error Average Data Archive Processor: Processing Aborted with Errors. Error Message: No Matching Reading Records were found

Internal Reports

Journal Message Log

The **Journal Message Log** (**Reports** > **Internal Reports** > **Journal Message Log**) displays messages about selected **Logging Types**. Logging Types are displayed in a drop-down check list when you click the arrow in the **Logging Type** field. Type selections are: **Fatal**, **Exception**, **Error**, **Warning**, **Startup**, **Shutdown**, **Information**, **Communication**, **Verbose**, **Debug**, **Timed Even**t, or **Select all**.

▶ **Note:** To log detailed information about a specific (problematic) Logging Type or Types, select that **Logging Type** in addition to **Verbose** from the drop-down menu before you generate the Journal Message Report.



Journal Message Report

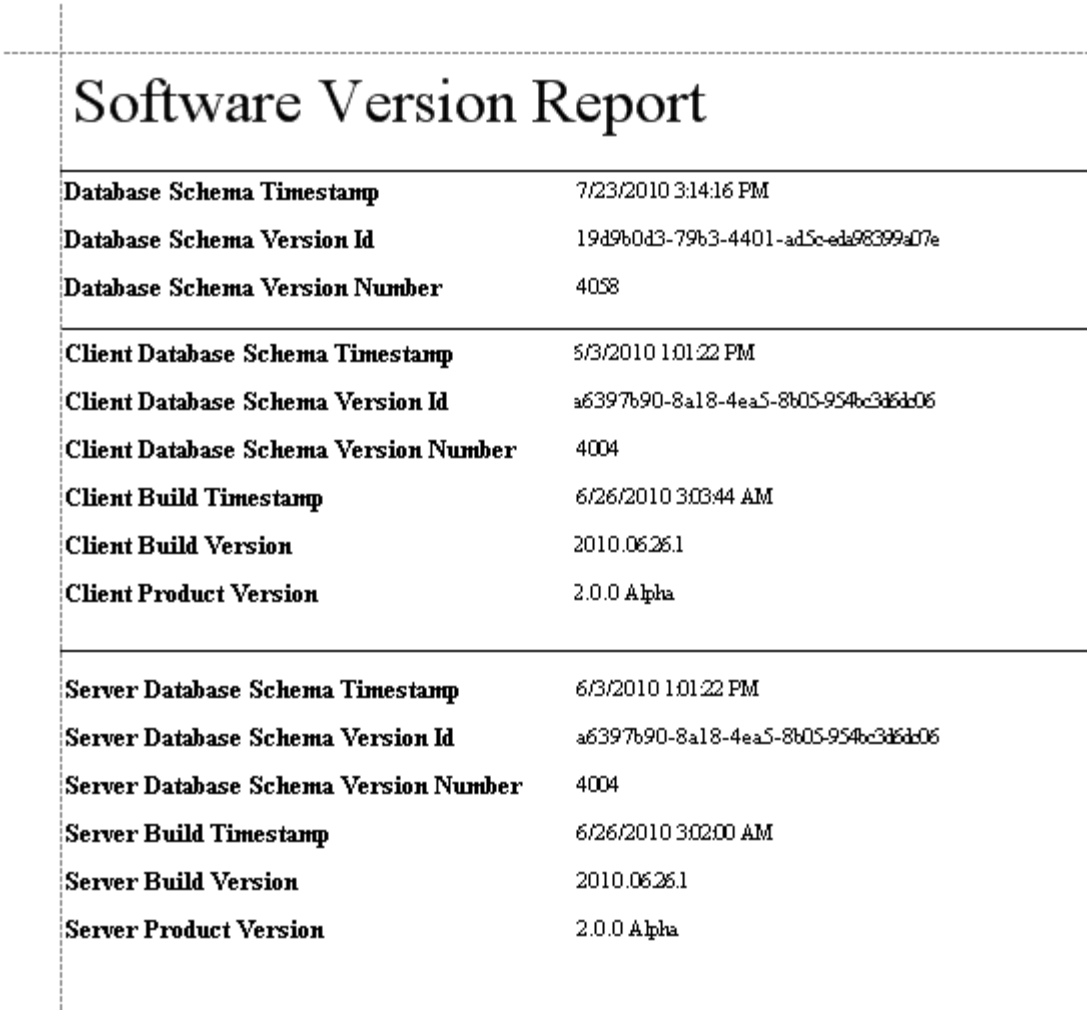
Time Stamp	Computer Name	Program Name	Event Log Type	Message Text
09/28/2010 10:02:58967	HP_Server	AirVision.Client	Exception	No connection could be made because the target machine actively refused it 172.16.1.209:9885
09/28/2010 10:03:38900	HP_Server	AirVision.WindowsService	Information	Login Request [SYSTEM], User=, ClientIP=HP_Server,172.16.1.209
09/28/2010 10:03:39513	HP_Server	AirVision.WindowsService	Information	LOGIN SUCCESSFUL [SYSTEM], User=AirVision, ClientIP=HP_Server,172.16.1.209, SessionID=95eb64f9-a15e-46e7-be69-93faf9039188, UserID=b0564391-4ff9-d4l1-9b07-80le8c085252
09/28/2010 10:03:43873	HP_Server	AirVision.WindowsService	Information	Found 0 root level tasks
09/28/2010 10:03:50043	HP_Server	AirVision.WindowsService	Information	Login Request [USER], User=airvision, ClientIP=HP_Server,172.16.1.209
09/28/2010 10:03:50060	HP_Server	AirVision.WindowsService	Information	LOGIN SUCCESSFUL [USER], User=AirVision, ClientIP=HP_Server,172.16.1.209, SessionID=140b4b-059-4e3b-4f82-9082-89b0f8e6a53d, UserID=b0564391-4ff9-d4l1-9b07-80le8c085252

Journal Message Log (Reports > Internal Reports > Journal Message Log)

Internal Reports

Software Version Report

The **Software Version Report** (**Reports>Internal Reports >Software Version Report**) displays Timestamps for **Database Schema** and **Software Builds**, **Version IDs**, and **Software Version**. The Software Version REport is primarily used for troubleshooting in the event of unusual software behavior.



Software Version Report

Database Schema Timestamp	7/23/2010 3:14:16 PM
Database Schema Version Id	19d9b0d3-79b3-4401-ad5c-eda98399a07e
Database Schema Version Number	4058
Client Database Schema Timestamp	5/3/2010 1:01:22 PM
Client Database Schema Version Id	a6397b90-8a18-4ea5-8b05-954bc3d6dc06
Client Database Schema Version Number	4004
Client Build Timestamp	6/26/2010 3:03:44 AM
Client Build Version	2010.06.26.1
Client Product Version	2.0.0 Alpha
Server Database Schema Timestamp	6/3/2010 1:01:22 PM
Server Database Schema Version Id	a6397b90-8a18-4ea5-8b05-954bc3d6dc06
Server Database Schema Version Number	4004
Server Build Timestamp	6/26/2010 3:02:00 AM
Server Build Version	2010.06.26.1
Server Product Version	2.0.0 Alpha

Software Version Report (Reports>Internal Reports)

Internal Reports

Table Size Information

The **Table Size Information Report** lists all tables in the database and their size.

Table Size Information Report

Table Name	Rows	Reserved (K)	Data (K)	Index Size (K)	Unused (K)
All Tables	24,400	29,160	24,288	4,280	592
AdvpCharacteristicRelation	12	32	8	24	0
AdvpDataCharacteristic	4	32	8	24	0
AdvpHistoricalAverage	0	0	0	0	0
AdvpLogicalJoinOperator	2	32	8	24	0
AdvpRuleCondition	0	0	0	0	0
AdvpRuleStatus	0	0	0	0	0
AdvpRuleStatusSite	0	0	0	0	0
AdvpValueComparisonType	4	32	8	24	0
AlarmAdvpParameter	0	0	0	0	0
AlarmAdvpRule	0	0	0	0	0
AlarmAdvpTask	0	0	0	0	0
AlarmTriggerFlag	0	0	0	0	0
AmbAirNowFlagDetail	6	16	8	8	0
AmbAirNowTask	0	0	0	0	0
AmbAqiLevel	63	88	56	32	0
AmbAqiProgram	10	32	8	24	0
AmbAqsBlankType	3	32	8	24	0
AmbAqsCompositeType	5	32	8	24	0
AmbAqsCountyTribalCode	3,376	784	504	248	32
AmbAqsDurationCode	23	32	8	24	0
AmbAqsFrequencyCode	31	32	8	24	0
AmbAqsNullCode	52	64	16	48	0
AmbAqsParameterCategory	4	32	8	24	0
AmbAqsParameterType	1,065	320	240	72	8
AmbAqsStateCode	57	48	8	40	0
AmbAqsUnitCode	124	56	24	32	0
AmbFrequencyDistribRange	0	0	0	0	0
AmbFrequencyDistribution	0	0	0	0	0
AmbFtpTransfer	0	0	0	0	0
AmbVosProgram	0	0	0	0	0
AmbWindRoseLevel	16	16	8	8	0
AmbWindRoseProgram	2	32	8	24	0

Table Report (Reports>Internal Reports)

Logger Reports

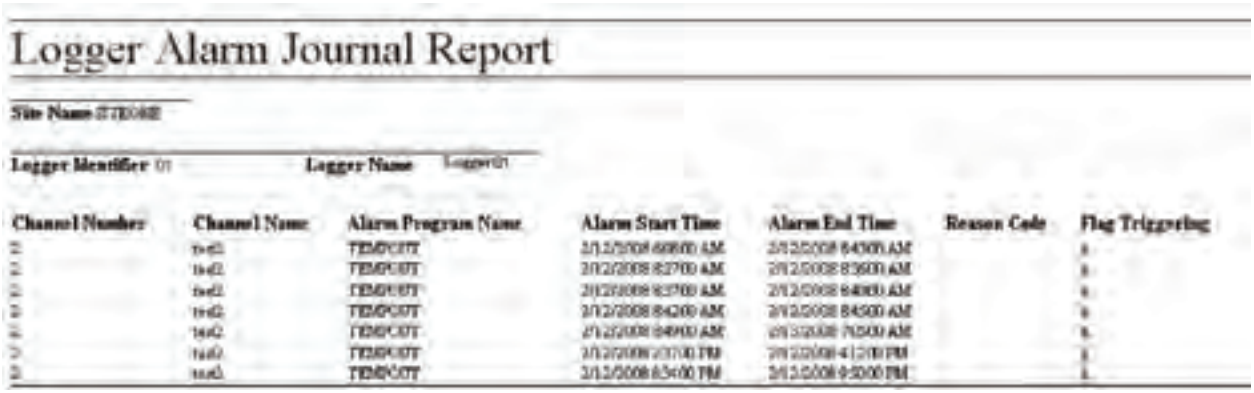
The **Logger Reports** folder in the **Reports** menu contains the following reports:

- **Alarm Journal**
- **Input Line Status Report**
- **Power Failure Report**

Alarm Journal

The **Alarm Journal** displays the Site Name, Channel Number, Channel Name, Alarm Program Name, Alarm Start/End Time, Reason Code, and Triggering Flag.

To run an **Alarm Journal**, select **Reports** > **Logger Reports** > **Alarm Journal**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/ Source Name**. Click the **Generate Report** icon. A Logger Alarm Journal Report will be displayed in the bottom section of the screen.



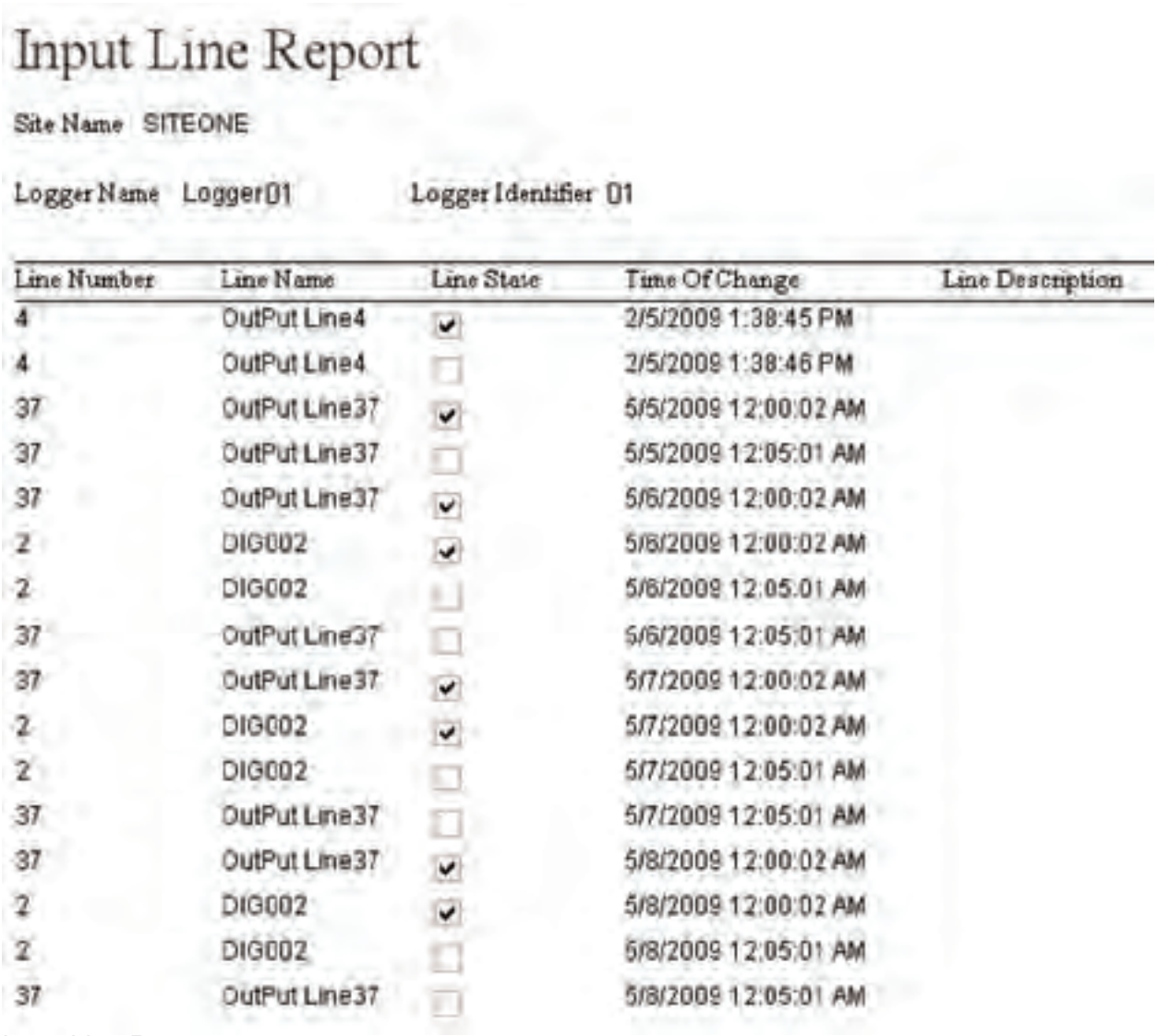
Logger Alarm Journal Report

Logger Reports

Input Line Status Report

The **Input Line Status Report** displays Site and Logger Name, Logger ID, Line Number Line Name, Line State, Time of Change, and Line Description.

To run an **Input Line Status Report**, select **Reports** > **Logger Reports** > **Input Line Status Report**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/ Source Name**. Click the **Generate Report** icon. An **Input Line Status Report** will be displayed in the bottom section of the screen.Each site/logger is shown in a separate page.



Input Line Report

Site Name SITEONE

Logger Name Logger01 Logger Identifier 01

Line Number	Line Name	Line State	Time Of Change	Line Description
4	OutPut Line4	☑	2/5/2009 1:38:45 PM	
4	OutPut Line4	☐	2/5/2009 1:38:46 PM	
37	OutPut Line37	☑	5/5/2009 12:00:02 AM	
37	OutPut Line37	☐	5/5/2009 12:05:01 AM	
37	OutPut Line37	☑	5/6/2009 12:00:02 AM	
2	DIG002	☑	5/6/2009 12:00:02 AM	
2	DIG002	☐	5/6/2009 12:05:01 AM	
37	OutPut Line37	☐	5/6/2009 12:05:01 AM	
37	OutPut Line37	☑	5/7/2009 12:00:02 AM	
2	DIG002	☑	5/7/2009 12:00:02 AM	
2	DIG002	☐	5/7/2009 12:05:01 AM	
37	OutPut Line37	☐	5/7/2009 12:05:01 AM	
37	OutPut Line37	☑	5/8/2009 12:00:02 AM	
2	DIG002	☑	5/8/2009 12:00:02 AM	
2	DIG002	☐	5/8/2009 12:05:01 AM	
37	OutPut Line37	☐	5/8/2009 12:05:01 AM	

Logger Reports

Power Failure Report

The **Power Failure Report** displays Site and Logger Name, Logger ID, Failure Time and Restored Time.

To run a **Power Failure Report**, select **Reports** > **Logger Reports** > **Power Failure Report**. In the **Report Criteria** screen, select a **Start/End Date** and a **Site/ Source Name**. Click the **Generate Report** icon. A **Power Failure Report** will be displayed in the bottom section of the screen. Each site/logger is shown in a separate page.

Logger Power Failure Report

Site Name SITEONE Site Description SITE 01

Logger Name Logger01 Logger Identifier 01

Failure Time	Restored Time
11/25/2007 12:00:00 AM	11/25/2007 12:01:00 AM
11/25/2007 12:01:00 AM	11/25/2007 12:01:00 AM
7/2/2008 10:56:00 AM	7/2/2008 10:56:00 AM

Power Failure Report

Other Reports

Annotations Report

The Annotations report may be run on any list of parameters, for any time range. It provides a summary of all annotations it finds.

To see a report of annotations made in the **Average Data Editor**, open the **Reports** menu and select **Annotations Repor**t. Make the usual query selections of **Start/End Date**, **Average Interval**, and **Parameter(s)**. Click the **Generate Report** icon on the ribbon.

Current Date : 9/28/2010
Current Time : 9:10 PM

Annotation Report

01-Mar-2006 00:00 to 06-Mar-2006 00:00

Site: Roane_Y
Parameter: 02_SO2

Category	User Name	Annotation Date	Date	Annotation
Instrument Failure	Admin	28-Sep-10 21:10	01-Mar-06 20:00	Lightning strike
Maintenance	New User	28-Sep-10 21:09	01-Mar-06 05:00	Replaced pump seal
Maintenance	New User	28-Sep-10 21:09	01-Mar-06 06:00	Replaced pump seal
QA Note	Fred5	28-Sep-10 21:09	01-Mar-06 09:00	Quarterly Audit
QA Note	Fred5	28-Sep-10 21:09	01-Mar-06 10:00	Quarterly Audit
QA Note	Fred5	28-Sep-10 21:09	01-Mar-06 11:00	Quarterly Audit

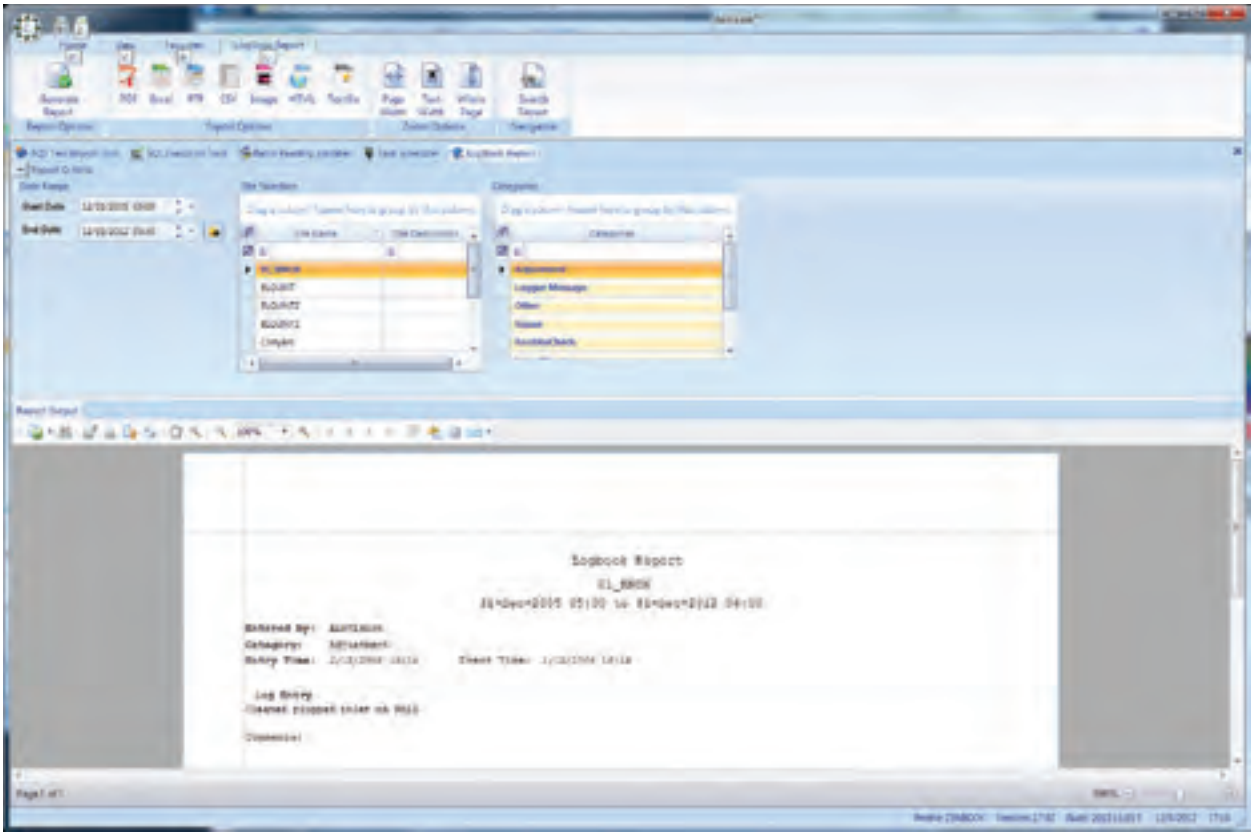
Annotations Report

Other Reports

LogBook Report

The **LogBook Report** generates reports of logbook entries that were made in the **LogBook Entries Editor**. To query a LogBook Report select LogBook Report from the **Reports** menu. Select **Start** and **End Dates** and a **Site Name** from the top section of the screen and click the **Generate Report icon** in the upper left section of the screen. The user may also choose one or all Logbook Categories as a filter for the report.

The logbook report will be displayed in the lower section of the screen



LogBook Report

Chapter 5

Data Editors

Average Data Editor

The 8872 **Average Data Editor** (**Data Editors** > **Average Data Editor**) combines multiple functions into a single tool:

- Editing data point details
- Batch editing
- Comparison of current data with historical minimum, maximum, and mean
- Analyze/Exported

In addition, you can toggle between the following six formats by clicking buttons in the ribbon at the top of the screen:

- Linear Table (the default display)
- Cross-Tab Table
- Matrix Table
- Time Series Graph (can be used for single or multiple parameters, but the historical comparison tools in this X-Y scatter plot only appear in single-parameter queries)
- Scatter Plot graph (requires queries of two or more parameters)
- Histogram (for single parameter queries)

Ribbon bar to toggle between Data Editor displays

To edit data in the **Average Data Editor** (**Data Editors** > **Average Data Editor**), enter

- **Start** and **End Date** (type dates or use arrow keys to select)
- **Average Interval** (for example, 001h Hourly average of 60 minutes)
- **Parameter Selection** (for example, **Site Name** NKNOX, **Parameter Name** NO2, **Parameter Template** NO2)
- Click the **Retrieve Data** button in the ribbon at the top of the screen

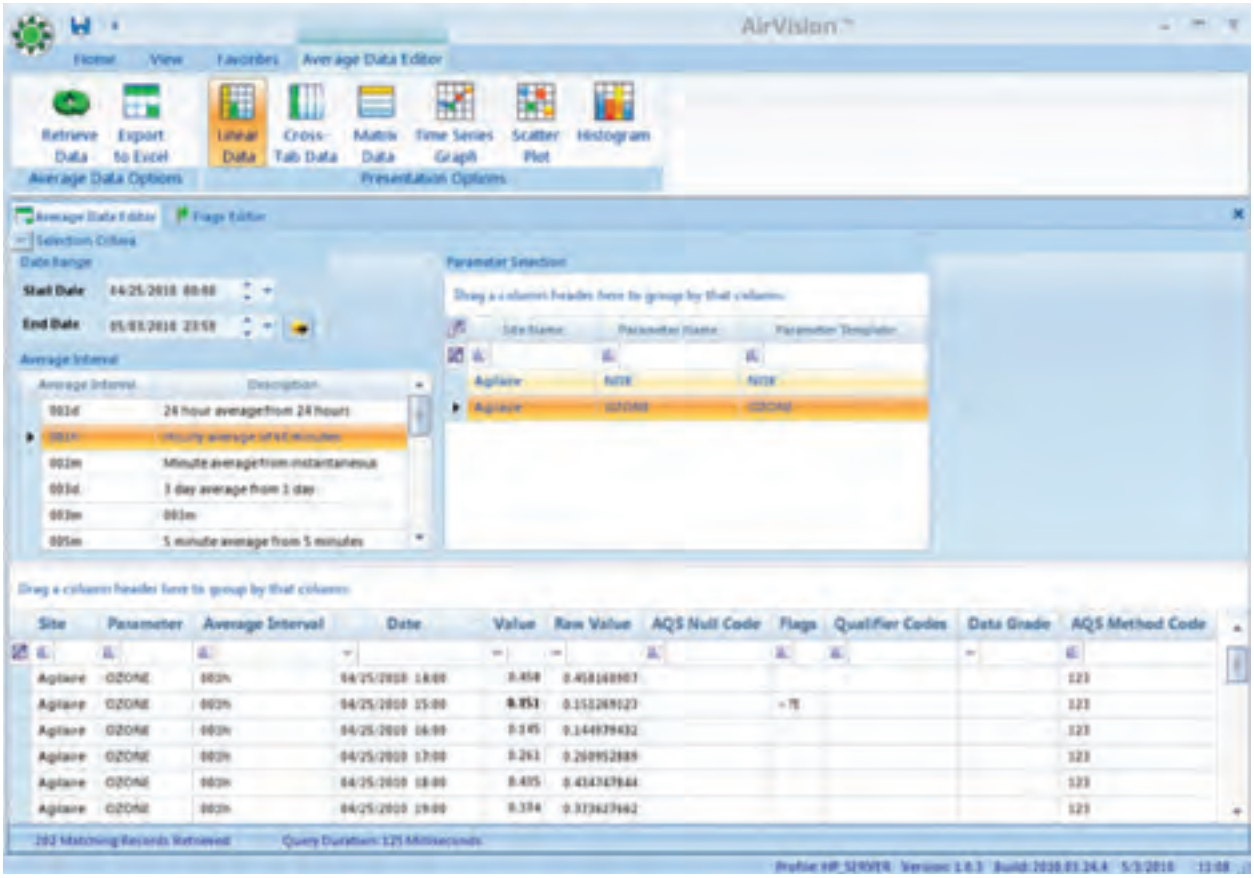
The Average Data Editor will open the Linear Data Editor by default. Click buttons in the ribbon to change formats.

Linear Data Editor

The Linear Data Editor

- Site Name, Parameter Name, Parameter Template Name
- Average Interval
- Start and End Dates
- Value (Hover the mouse pointer over data values to see any annotations.)
- Raw Value (can't be edited)
- AQS Null Codes
- Data Logger Flags
- Qualifier Codes
- 8872 Data Grade (used by ADVP).

To edit data values, double-click in the Value cell or right-click to bring up a pop-up menu.



Average Data Editor from Data Editors menu

Cell Color Codes

All data is color-coded based on the flag-to-color mappings listed in the **Flags Editor**. The Model 8872 is loaded with some default mappings, but you can customize this for your system. The color mappings are global to all users for consistency.

In addition, the 8872 uses two font changes to represent data in the data editor:

- **Bold** values represent data that does not match the raw database (edited values)
- *Italics* values represent data that has an annotation. Hover the mouse pointer over data values to see details of annotations.

Right-Click Options

Each of the three non-graphical data editors support select, shift-select, CTRL-select, click-drag selection capabilities, and a right-click menu options. Right-click a data point in the **Value** column to bring up the following menu:

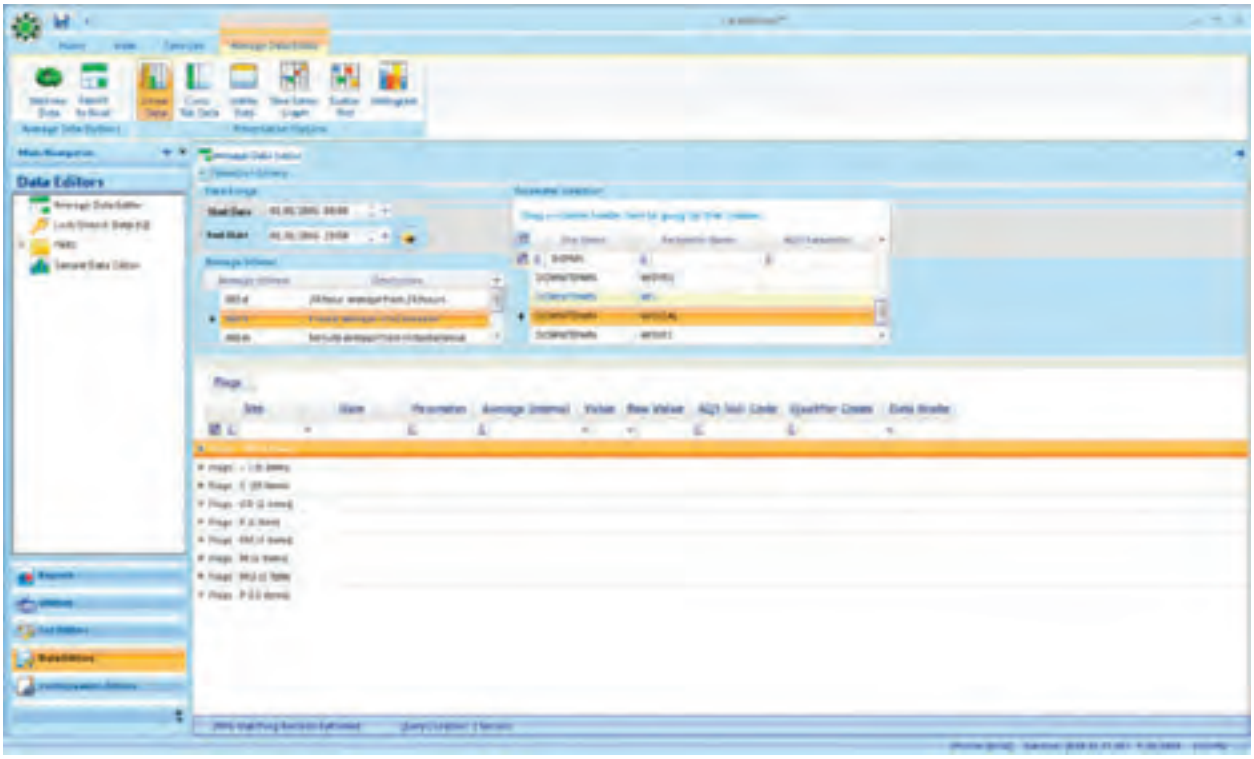
- **Restore from Raw** copies value from the raw database to the final **Value** and resets flags
- **Set to Minimum Detectable Limit** sets data value to MDL configured in Parameter Editor
- **Set AQS Code** brings up a pick list to apply new AQS null codes
- **Set Qualifier Code** brings up a selection box for AQS qualifier (exception) codes
- **View All Flags** (for single data points only) shows all data logger and system flags and allows you to change or clear flags. Multiple flags can be displayed in each cell.
- **Set Annotations** brings up an annotation screen so you can add an annotation.
- **Batch Edit** allows you to scale two or more selected data values as **mX+b** (Original Value times a Multiplier plus a Constant Value), for example, divide by 10 and clear the suspect flag. First, you must select **Enabled**.You have the option to combine scaling with one or more of the following: **Update Values**, **Set Annotations**, **Set AQS Code**, **Set Qualifier Code**, and **Set Flags**. If you select **Set Flags**, you will have the option to **Update Children Flags**.
- **Show Children** brings up another instance of the Data Editor with the selected parameters and time range for the **Child** parameter(s) of the selected parameter. This function requires that **Parent-Child Parameter** relationships are configured in **Configuration Editors** > **Parameter Settings**.
- **Drill Down Interval** allows you to drill down to minute averages from hourly averages.
- **Export to Excel** exports the selected data range to an Excel document, including color, font, and layout details. This right-click option is different from the Export to Excel button in the ribbon at the top of the screen because the button on the ribbon exports the entire data set in the data editor and the right-click option exports only selected data.

Click a column heading to sort data by a different heading, for example to group data according to flags. Default is to sort by date.

Click-hold-drag columns to change the order of columns or to drag a column heading to the **Drag a column header here to group by that column** area.

Cross-Tab Data Editor

The **Cross-Tab Data Editor** shows Parameters as columns and sequences rows by date/time in ascending order and provides the same right-click menu as the Linear Data Editor.

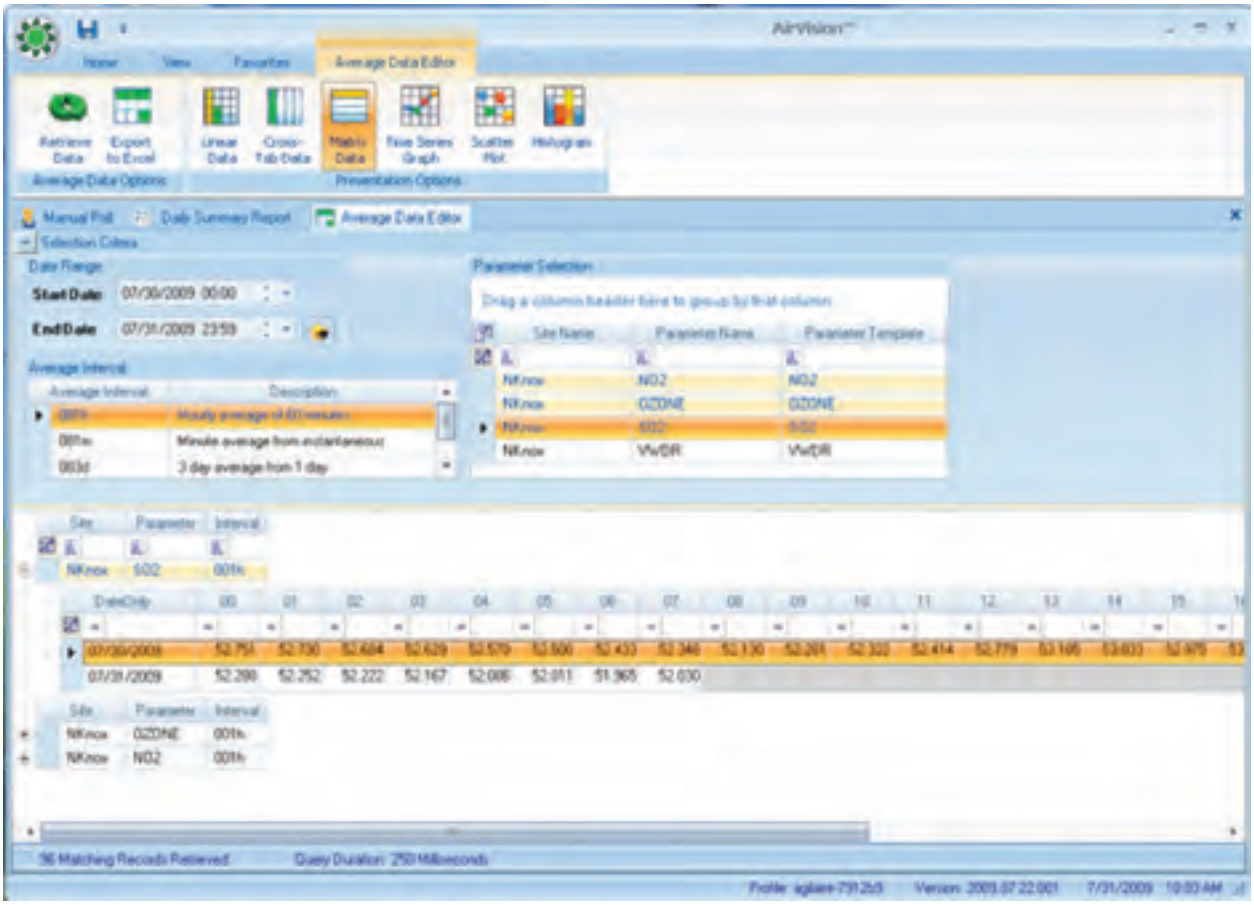


Cross-Tab Data Editor from Data Editors menu

▶ **Note:** You can sort data by any column by clicking on a column header. You can find all flagged data easily, for example data grouped by data logger flag. Each group can then be expanded and individually sorted. When you change editor modes, the groupings are not kept.
Also, you can click-hold-and-drag columns to change the order, and click-drag columns to the **Drag a column header here to group** area to group data. If you do this accidentally or change your mind, you can drag it back.

Matrix Data Editor

The Matrix Data Editor presents data in a format similar to the monthly report. If you select multiple parameters, they are grouped with a plus (+) symbol for expansion.

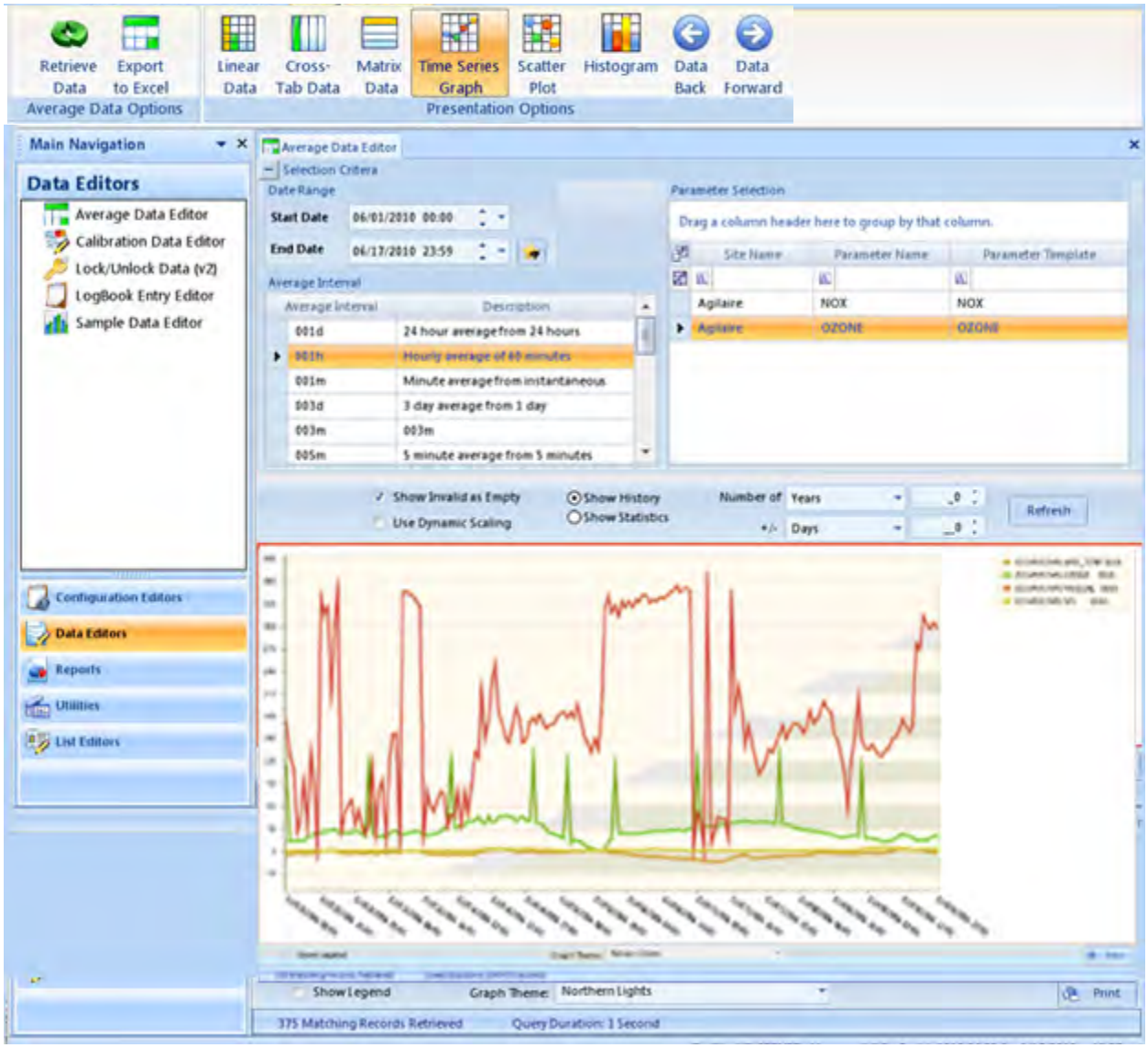


Matrix Data Editor from Data Editors menu

Time Series Graph

You can generate the Time Series Graph in two modes, for one or more parameters. In multi-parameter mode, you can group different parameters together for any time period. With the tools at the bottom or the screen, you can change the color scheme, remove or restore the legend, and print the graph.

The minus (-) sign in the upper left corner of the screen minimizes the selection criteria to make more room for the graph.



Time Series from Data Editors menu with multiple parameters selected

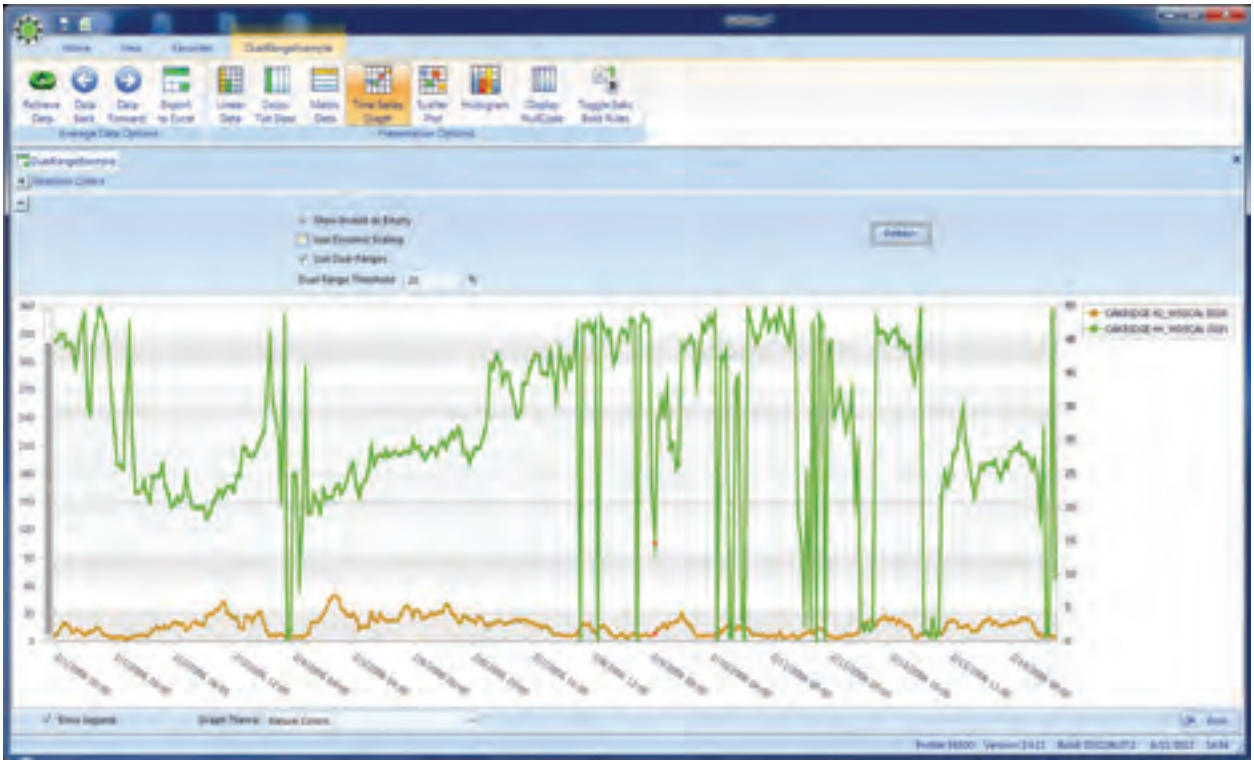
Use the mouse scroll wheel to zoom in or out; right-click and hold to drag the zoomed graph to a different data area.

Hover the cursor over a data point to see the specific date, time, and data value. If there is a flag on the data point the flag will also be displayed.|

You can toggle between hiding or showing invalid data (e.g., data during calibration, maintenance, or analyzer failures).

When graphing parameters with two dramatically different full scale ranges, you may choose to use the "Dual Y-Axis Scale" option. When choosing this option, you must also choose the percentage (e.g., 10%, 20%) of the full scale range that is used as the 'breakpoint' for the secondary Y-axis. A value of 20% is common. Note that this function requires that Graph Maximum and Graph Minimum be set in the Parameter configuration. Graphs that have any parameters without limits configured cannot use the Dual Y-Axis function.

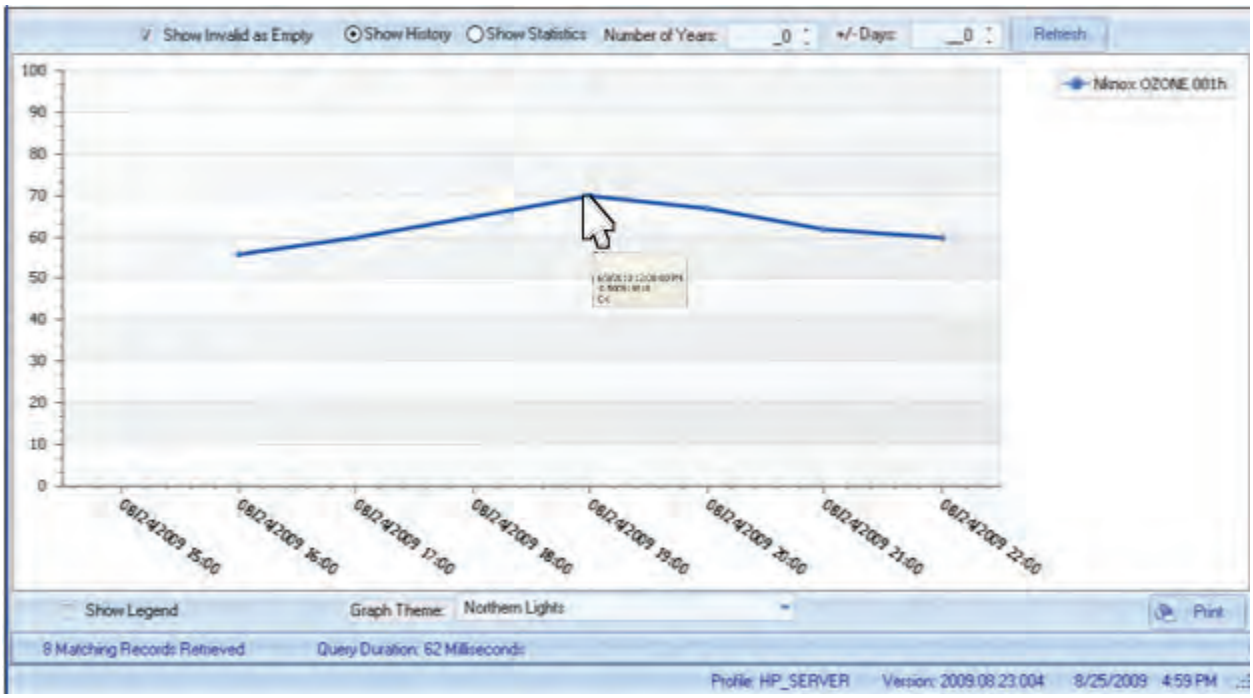
Suppress Flag Colors - If not selected, flagged data will be shown with “dots” with colors based on the Flag configuration. If selected, data will just be shown as the trend graph color. In both cases, hovering the cursor over the point will always show the flag, and the flag colors are still represented in the tabular/grid display.



Dual Y-Axis function

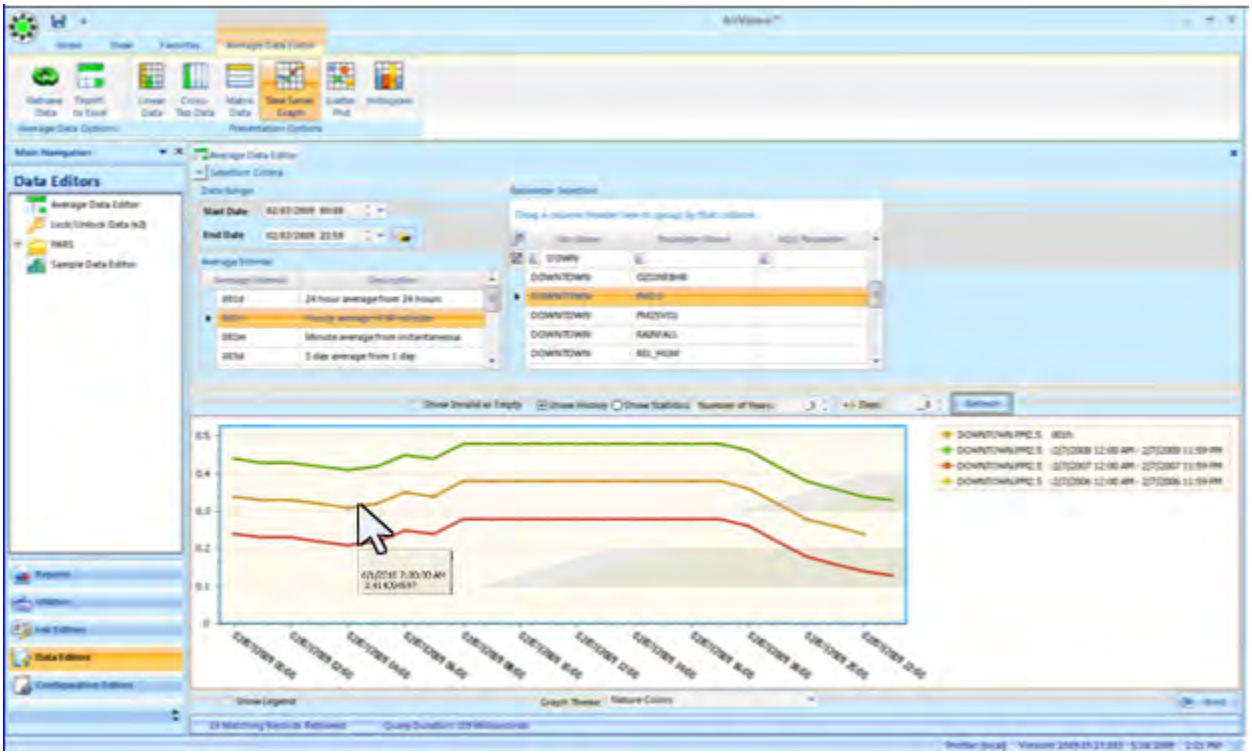
For one parameter, you can choose previous intervals to be other than one year by selecting **Show History** from the options above the graph.If you bring up the Time Series Graph in single parameter mode, you get additional options at the top of the graph:

- Show History displays N previous years of data alongside main graph
- Show Statistics displays cumulative statistics of N previous years--min, max, avg
- Number of Years
- +/- Days allows rolling average of additional days in historical statistics
- Refresh



Time Series Graph with a single parameter selected and hover over displaying date, time data value, and flag

If the database contains data from previous years for the same parameter, those previous years can be graphed in the Time Series Graph alongside the current data by selecting **Show History** and the number of years you want to graph. Each previous year is graphed individually. Select **Refresh** to update the graph.



Time Series Graph with a single parameter and Show History option and hover over displaying date, and time data value

The "+/- Days" selector can be used to compile nearby days for the same hour into the comparison statistics. An example of how this is applied would be:

Current Data = 1/15/09,. Number of Years = 3, +/- Days = 1

1/5/09 data at hour 00 would be compared against statistics using the following points:

1/4/06, hour 00
1/5/06, hour 00
1/6/06, hour 00
1/4/07, hour 00
1/5/07, hour 00
1/6/07, hour 00
1/4/08, hour 00
1/5/08, hour 00
1/6/08, hour 00

Obviously, selection of a large data set with a long look back period and large skews can be very processor intensive for the client and the SQL server for large data sets. Agilaire recommends this tool be used for data sets of roughly a week or less.

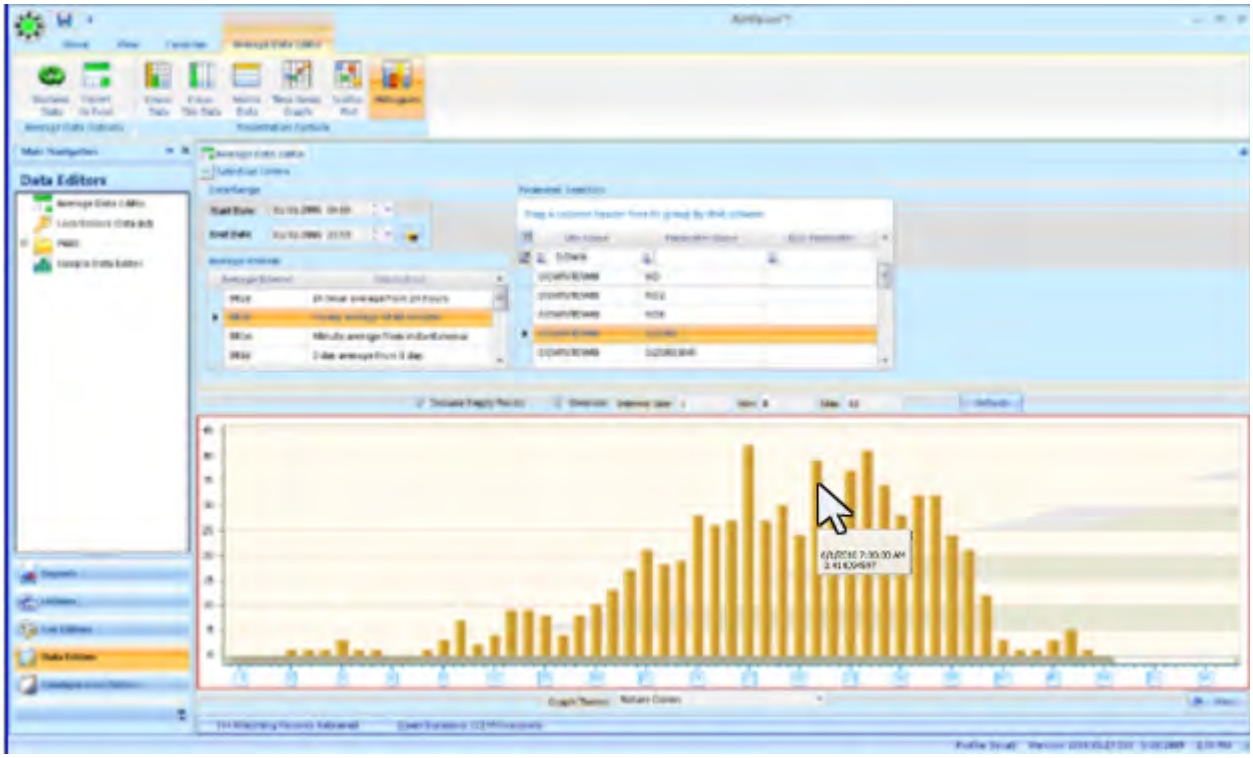
Scatter Plot Graph

The Scatter Plot Graph allows any two parameters in the existing chart to be plotted in an X-Y chart. The Y axis parameter is the primary parameter and all data points are color coded according to the Data Flags color mappings to help distinguish outliers that have already been flagged.

Scatter Plot Graph from Data Editors menu with hover over displaying date, time and data value

Histogram

The Histogram provides a graph of the distribution of values for the entire data set, but it is designed to display only one parameter at a time, so be careful not to use multiple parameters. The default graph uses the graph maximum/minimum from **Configuration Editors** > **Parameter Settings**, but you can check **Override** to set a custom max/min specifically for the X axis of this graph.



Histogram from Data Editors menu with hover over displaying date, time and data value

LogBook Entry Editor

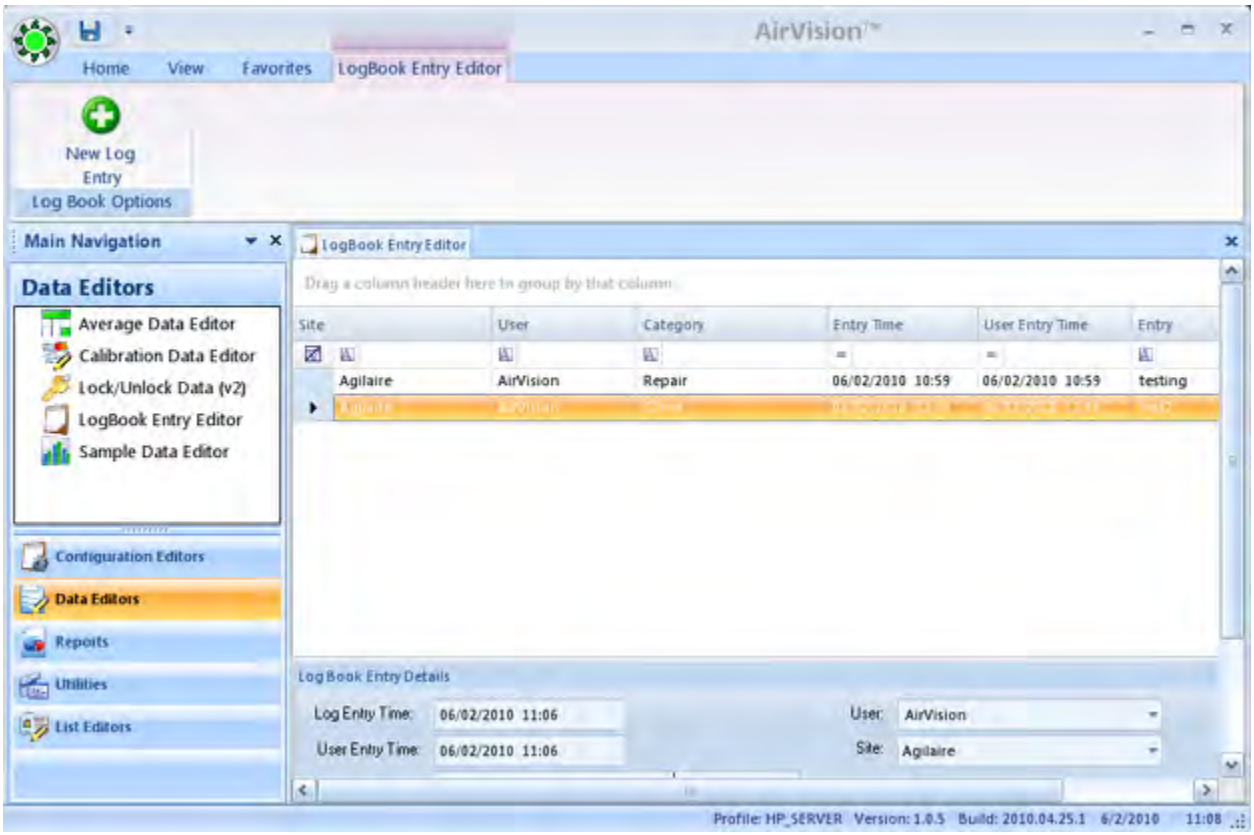
The LogBook Entry Editor allows you to make entries in a logbook that can then be seen in LogBook Reports. To make a logbook entry, open **LogBook Entry Editor** from the **Editors** menu.

Click the **New Log Entry** button in the upper left corner of the screen

In the bottom section of the screen enter a **Log Entry Time**, **User Entry Time**, select a **Category** from the drop-down list or select **New Category** and enter a different category, select a **User** and a **Site** from the drop-down lists

Enter the LogBook message in the **Entry Text** box and click **Save**.

The new entry information will be displayed in a row in the top section of the screen.



Adding LogBook entries in the LogBook Entry Editor from the Editors menu

By default, the logbook entries do not accept changes or addendums after the record has been saved. A system option is available to allow addendums to be made. To enable this, contact support@agilairecorp.com.

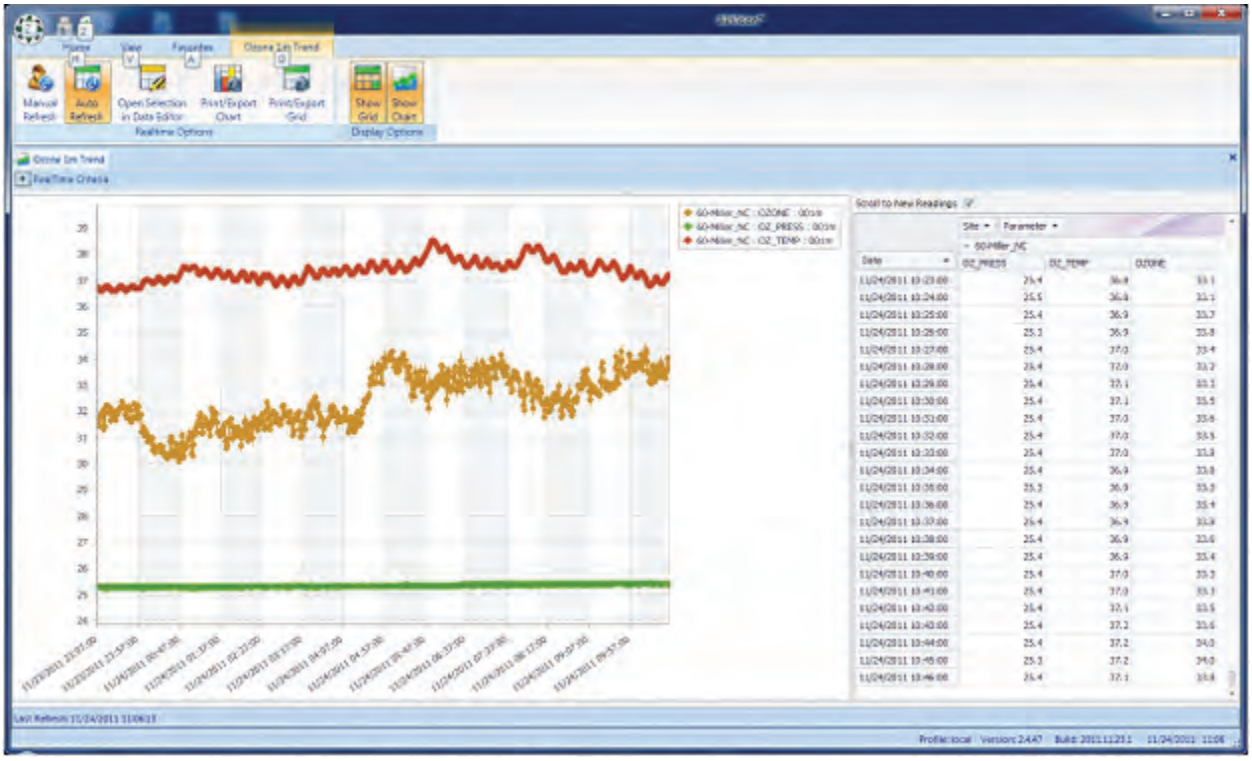
Chapter 6

Realtime Display Programs

The Model 8872 has three main realtime display programs to keep you informed of the realtime status of the readings, calibrations, I/O status, and averages:

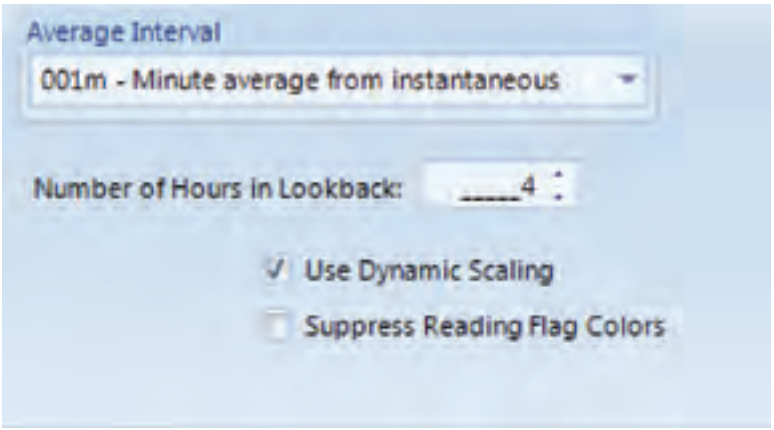
- **Realtime Trend** is the same display used by AV-Trend to provide strip-chart likes trends and basic tabular displays.
- **Tabular Display** provides a series of LED-like displays, which can be zoomed in to time-series charts. This display is very useful for mixing of multiple display averages (instantaneous, minute, hourly, etc) on the same page.
- **Site Node Logger Tool Box** is a blend of three tools:
  - **Readings** – current readings, and buttons to control / display maintenance or offline status of the channels; used to mark channels online/offline, or in/out of maintenance.
  - **Calibration** – shows the current status of calibrations, and allows you to start or abort a calibration program.
  - **Digital I/O** – show the current status of all physical or remote (Modbus) digital input/output points.

Realtime Trend Display



Realtime Graph in Status Displays>RealTime DataTrending Graph, showing both Chart and Grid

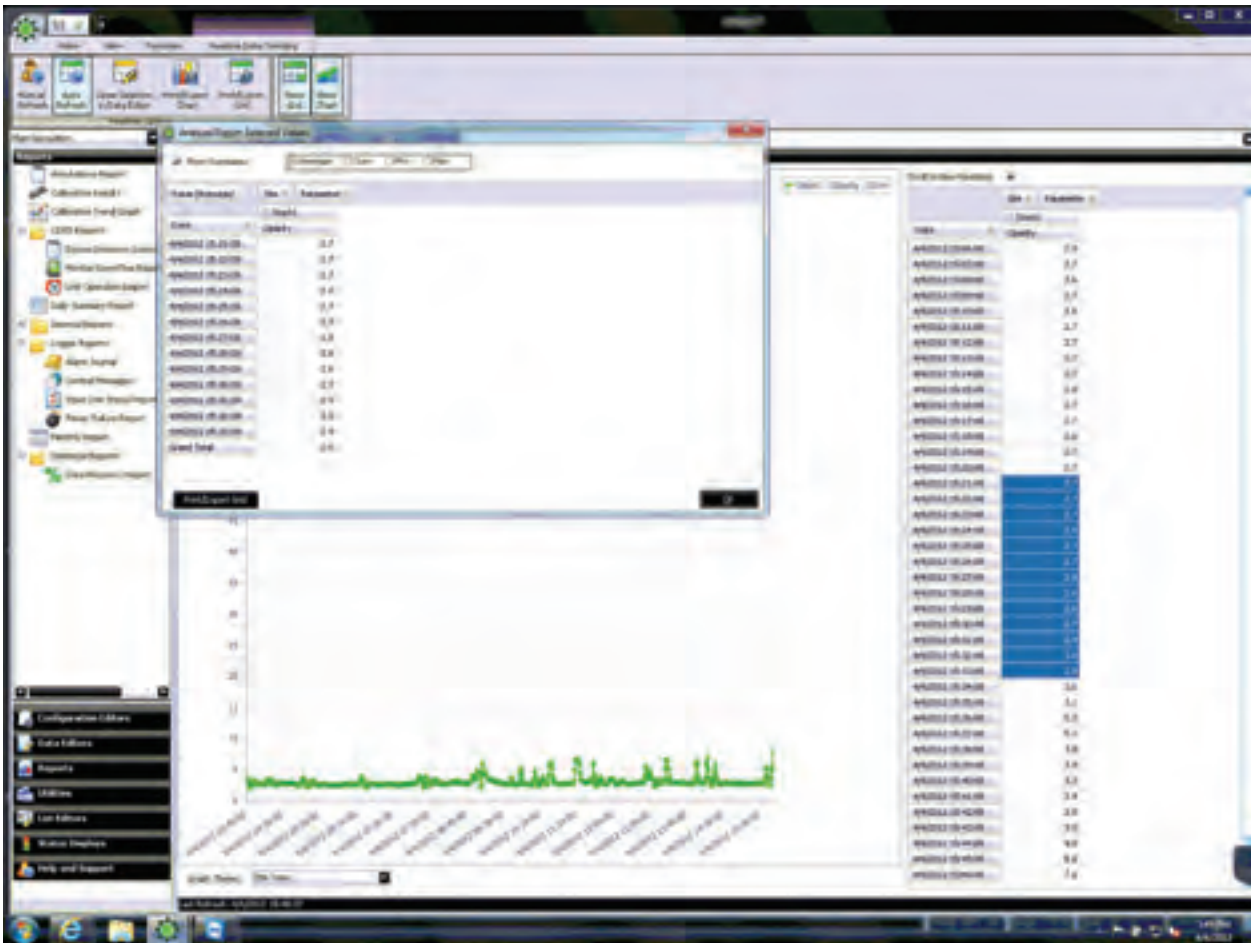
In the graph criteria, the user may select several customizations:


Average Interval
001m - Minute average from instantaneous
Number of Hours in Lookback: 4
Use Dynamic Scaling
Suppress Reading Flag Colors

- **Number of Hours in Lookback** - This allows the user to dynamically define the width of the graph. After changing, the user should select "Manual Refresh" from the ribbon to take effect. This preference is stored with any Favorite created.
- **Use Dynamic Scaling** - If selected, the data graph min/max is set based on the range of data, rather than the graph min/max configured in the Parameter settings editor.
- **Suppress Flag Colors** - If not selected, flagged data will be shown with "dots" with colors based on the Flag configuration. If selected, data will just be shown as the trend graph color. In both cases, hovering the cursor over the point will always show the flag, and the flag colors are still represented in the tabular/grid display.

Within the Real-Time Trend, the user may drag-select and right-click a list of data points. The user is then presented with two options:

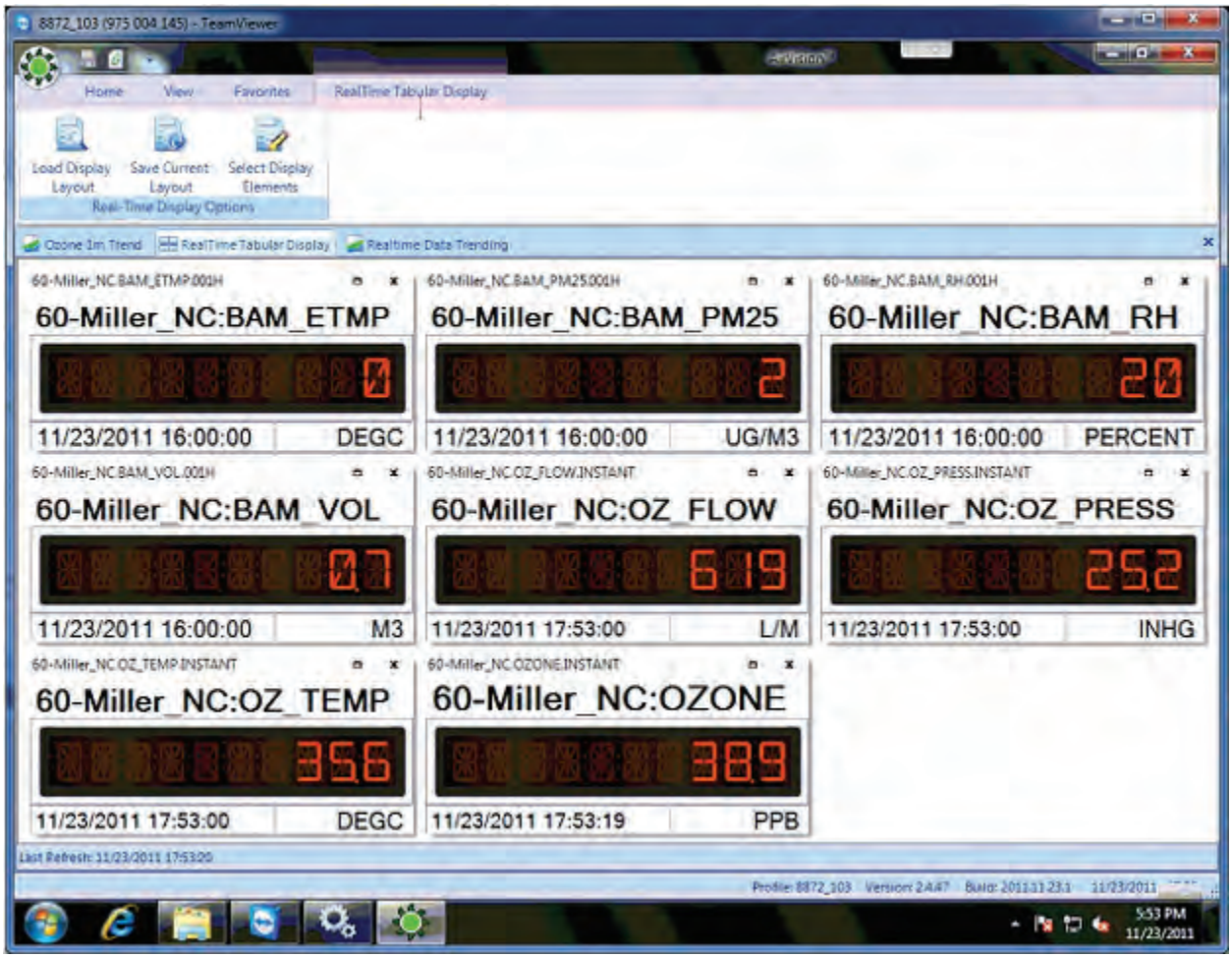
- **Annotate Selected** - this will allow the user to add a text annotation to the data, which will appear in future use of the Data Editor, or can be recalled in the Annotations Report.
- **Analyze Selected** - this will bring up a box, allowing the user to see an average, or other statistics of only the selected data points. This is commonly used to average calibration or test "runs" of data. The results can also be printed or saved using the "Print/Export Grid" button.



Right Click

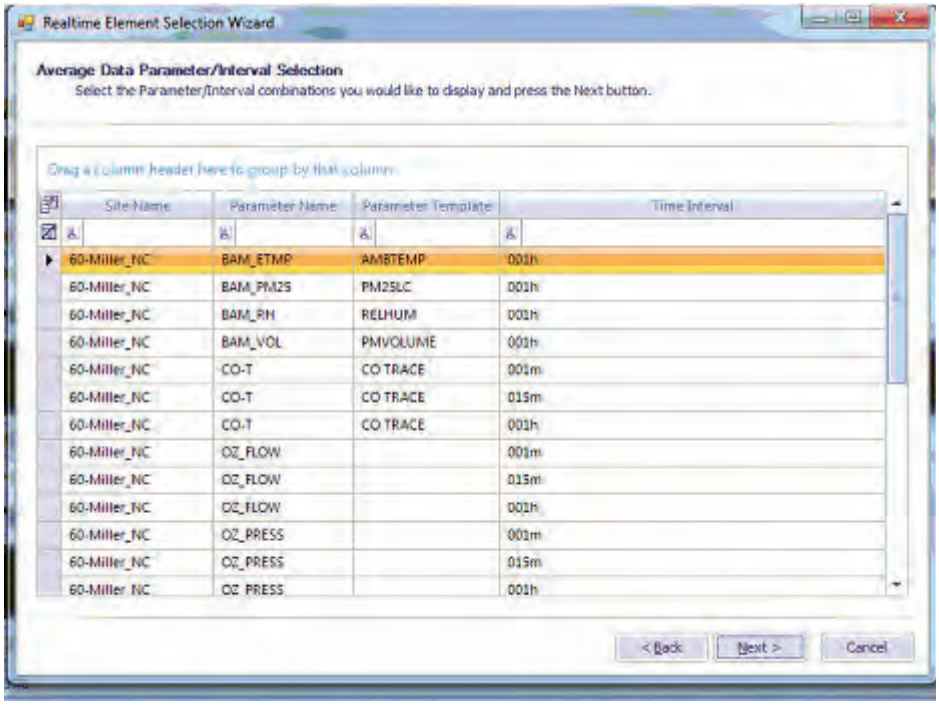
Tabular Display

The **Tabular Display** provides a series of LED-like displays, which can be zoomed in to time-series charts. The chart display is very useful for mixing multiple display averages (instantaneous, minute, hourly, etc) on the same page. Boxes can be dragged to create a custom layout, and the layout can be saved for future recall. Because of the complexity of the elements in the layout, they are stored separately than the regular Favorites system.

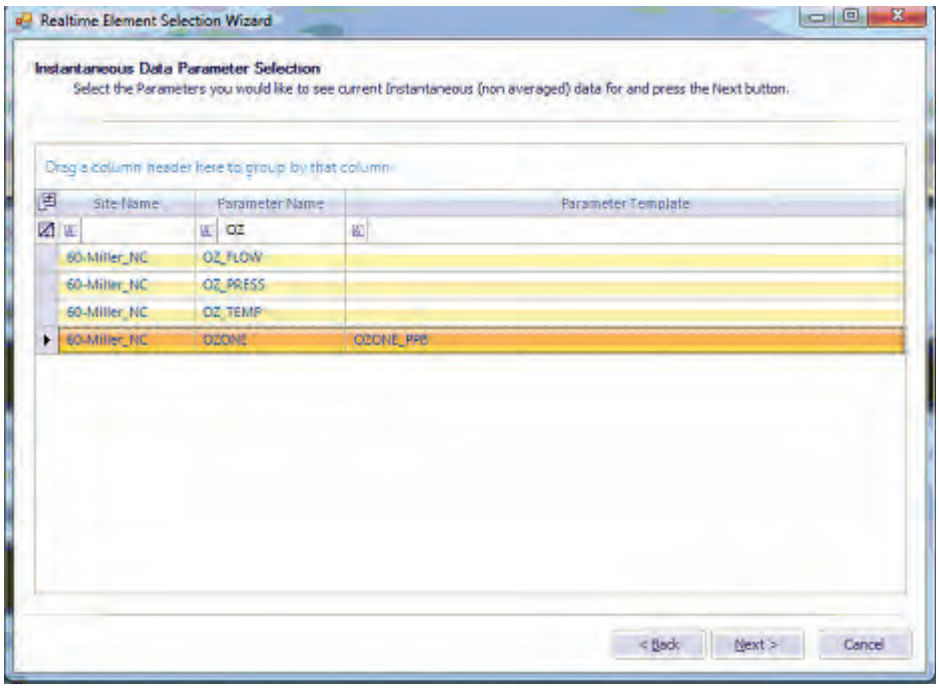


Create a new layout by clicking the Select Display Elements icon from the ribbon

You can use the filter fields to narrow parameter names and, more importantly, average intervals, if needed. The form supports standard Windows drag-select, shift-select, and CTRL-select actions. Note that the display will support multiple average intervals, so it is possible to mix minute and hourly data (e.g., analyzers and BAMs) on the same screen. Instantaneous data panels are selected on the next page.

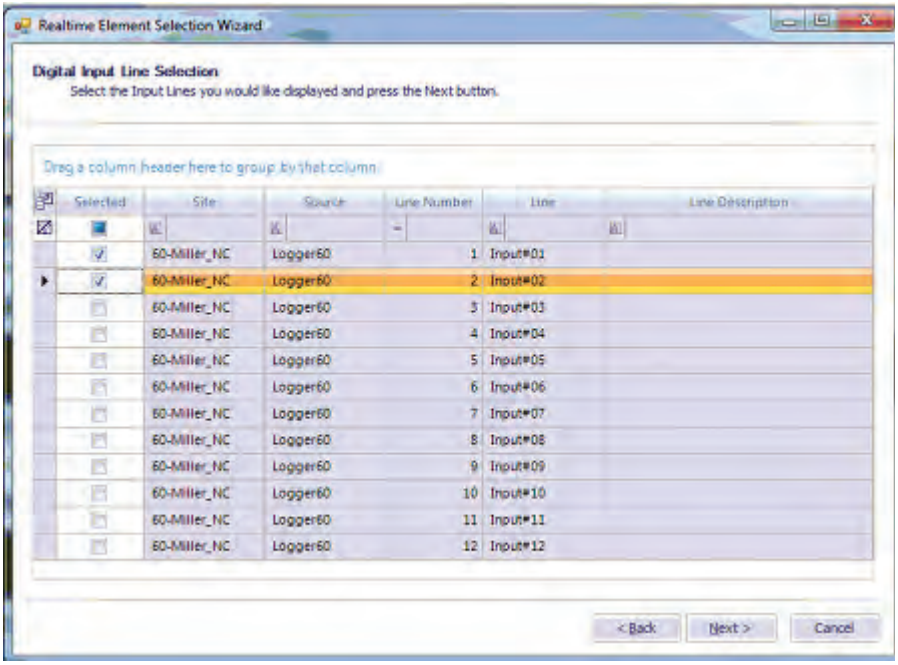

Realtime Element Selection Wizard
Average Data Parameter/Interval Selection
Select the Parameter/Interval combinations you would like to display and press the Next button.
Drag a column header here to group by that column
Site Name
Parameter Name
Parameter Template
Time Interval
60-Miller_NC BAM_ETMP AMBTEMP 001h
60-Miller_NC BAM_PM2S PM2SLC 001h
60-Miller_NC BAM_RH RELHUM 001h
60-Miller_NC BAM_VOL PMVOLUME 001h
60-Miller_NC CO-T CO TRACE 001m
60-Miller_NC CO-T CO TRACE 015m
60-Miller_NC CO-T CO TRACE 001h
60-Miller_NC OZ_FLOW 001m
60-Miller_NC OZ_FLOW 015m
60-Miller_NC OZ_FLOW 001h
60-Miller_NC OZ_PRESS 001m
60-Miller_NC OZ_PRESS 015m
60-Miller_NC OZ_PRESS 001h
< Back
Next >
Cancel

Realtime Element Selection Wizard--Average Data Parameter / Interval Selection


Realtime Element Selection Wizard
Instantaneous Data Parameter Selection
Select the Parameters you would like to see current (instantaneous (non averaged) data for and press the Next button.
Drag a column header here to group by that column
Site Name
Parameter Name
Parameter Template
OZ
60-Miller_NC OZ_FLOW
60-Miller_NC OZ_PRESS
60-Miller_NC OZ_TEMP
60-Miller_NC OZONE OZONE_PPB
< Back
Next >
Cancel

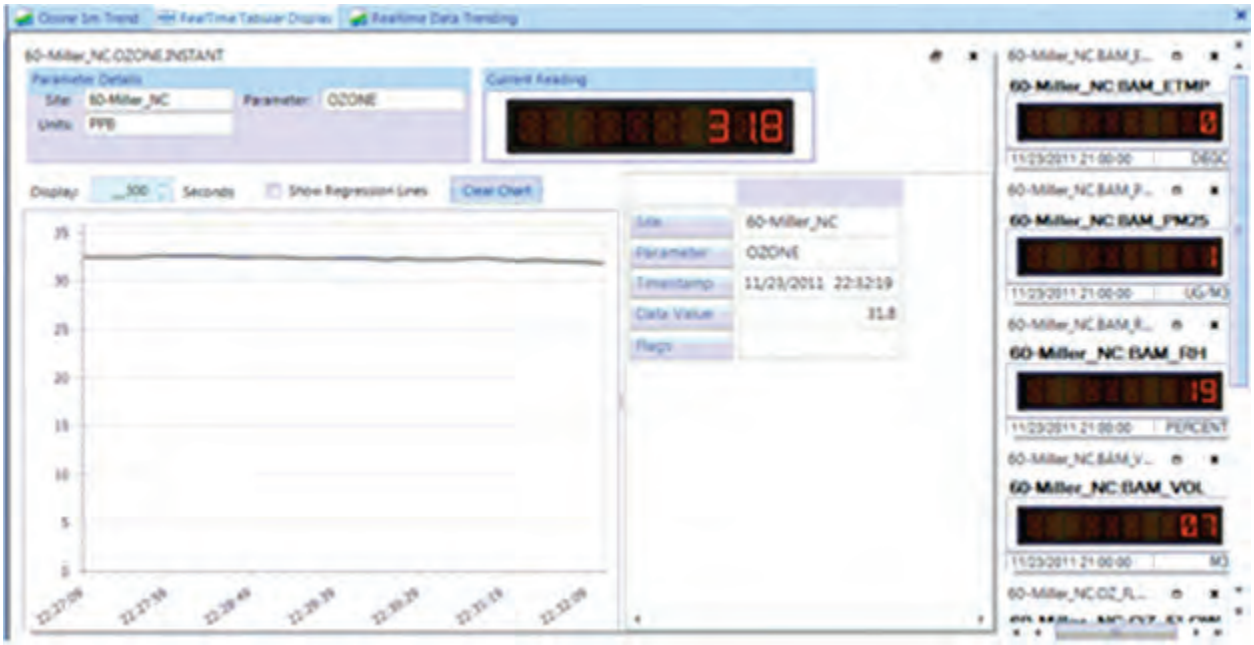
Realtime Element Selection Wizard--Instantaneous Data Parameter Selection

Finally, the Wizard asks if you want to view the realtime status of any digital input status lines. Select lines by clicking the left-side check boxes.



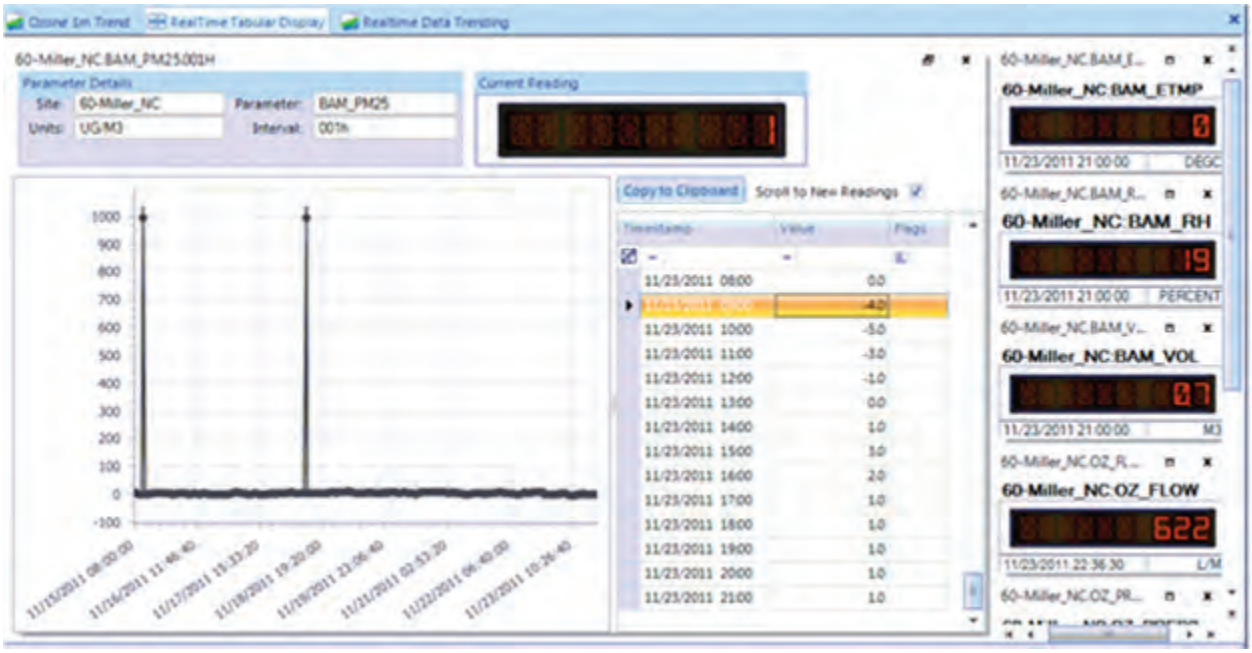
Realtime Element Selection Wizard--Digital Input Line Selection

Once the wizard is finished, the display will start and begin updating. Panels can be dragged into any desired order/arrangement by click-drag (click and drag from the **title bar** area at the top, above the large-font name). Panels can be eliminated by clicking the **X** box in the upper right. To zoom into a particular reading, click the expand box to the left of the **X**.



Updating Display with movable Panels

The other panels will minimize, and the selected parameters will expand into a trend chart, with an LED panel, still updating the current reading / average. For instantaneous data, the duration of the display can be modified if needed. Instantaneous readings default to show the previous 5 minutes, while charts of averages are longer. Instantaneous readings also have an option to show a trendline of the general direction of the newest readings.



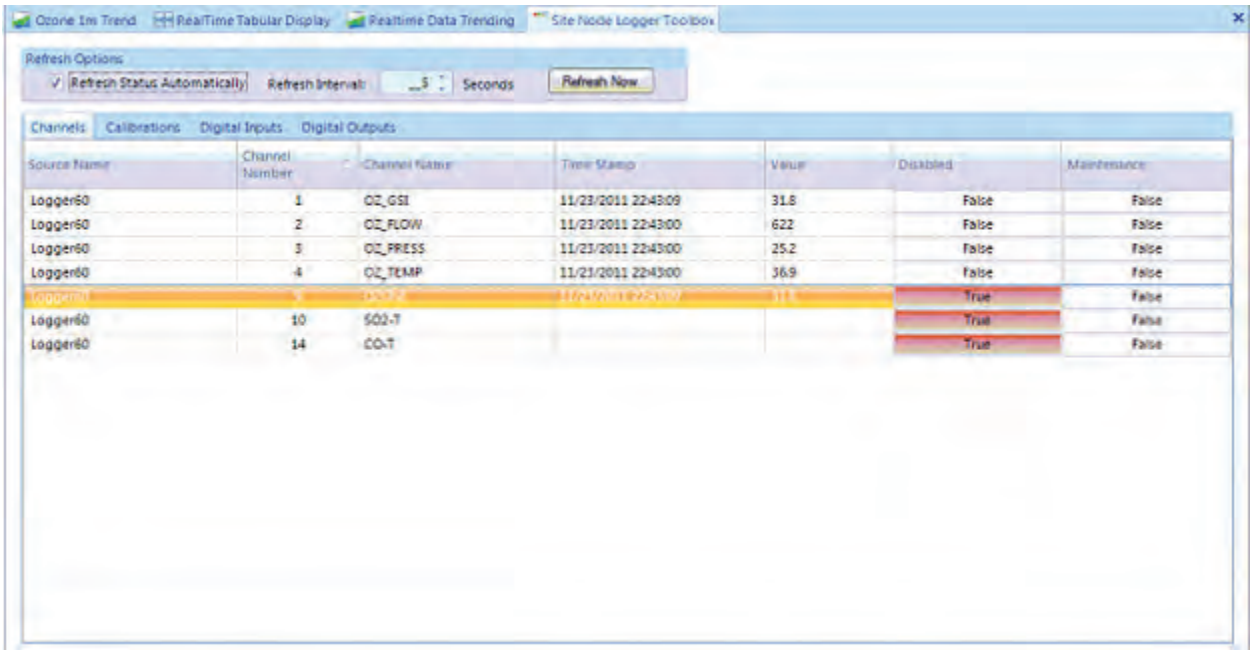
A grid of previous averages for averaged data.

To return the display to its previous mode, click the resize button (two stacked windows) next to the **X** close box.

Site Node Logger Tool Box

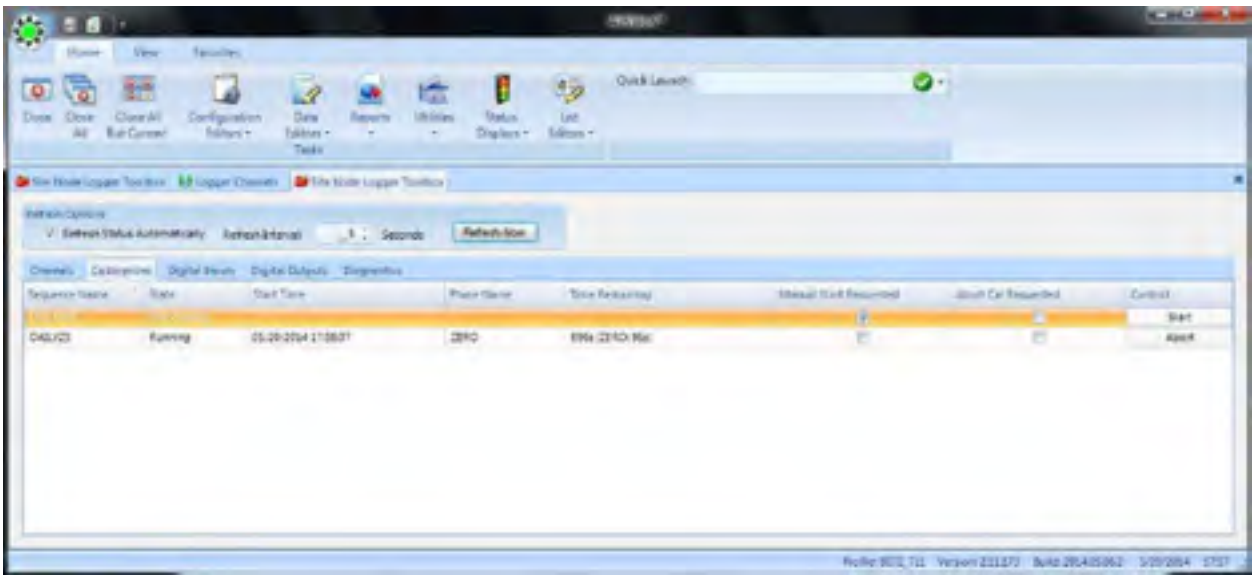
The **Site Node Logger Tool Box** contains four tabs:

- **Channels Tab** shows the current of readings of all channels (analog input, serial, or Modbus), as well as provide buttons to control and display the disabled (**D**) and maintenance (**M**) status of each channel. To mark a channel in/out of maintenance or to mark/unmark disabled, click the button.



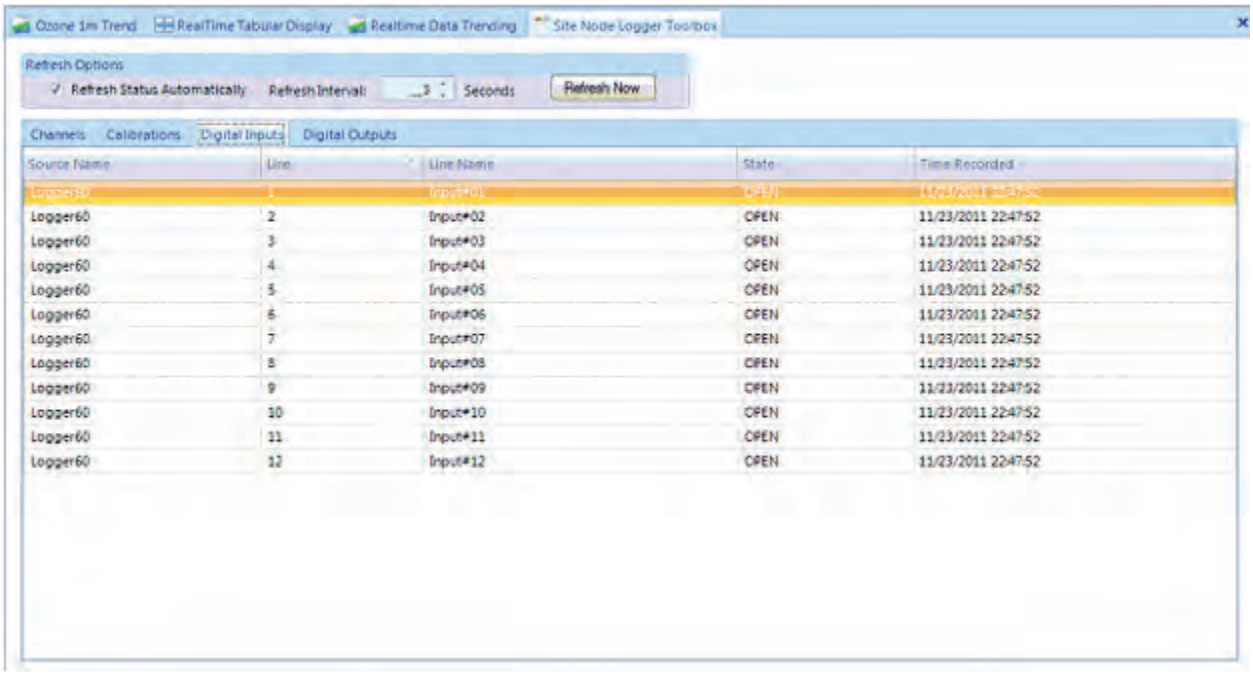
Channels Tab

- **Calibrations Tab** shows the current status of all configured calibration programs, as well as provide buttons to start or abort those calibrations.



Calibrations Tab

- **Digital Input and Output Tab** shows the current status of all status input output lines, both for physical inputs and remote (Modbus) lines. No control functions exist in these displays.



Digital Input and Output Tab

Appendix A – Logger Entities

The Model 8872 uses channel types, calibrations, and other entities of the same form as those used in the Model 8816 and Model 8832, to provide continuity for those users already familiar with those. The major exception is Math channels, which are now handled within the AirVision / AV-Trend software.

Appendix A.1– Channel Types

The different channel types distinguish the way that an input is taken, or the way averages are formed from the data. A summary of the various channel types follows:

Channel Type	*Description*
Standard Averaging	Takes the instantaneous values of an analog input on the Model 8872 and forms up to three linear averages.
Modbus	Takes the instantaneous values from a Modbus device (e.g., analyzer) and forms up to three linear averages.
GSI (Serial)	Takes the instantaneous values from a serial device (e.g., analyzer) and forms up to three linear averages.
Scalar Wind Speed	Takes the instantaneous values of an analog input or from another GSI channel and forms up to three linear averages. Provides three resultant averages.
Scalar Wind Direction	Takes the instantaneous values of an analog input or from another GSI channel and forms up to three unitary vector averages, taking into account 360 degree crossover (and resolving directions > 360 degrees for the case of 0-540 instruments). Provides three resultant averages.
Vector Wind Speed	Takes the instantaneous values of an analog input or from another GSI channel and forms up to three vector-based averages, based on a companion vector wind direction channel. Provides three resultant averages.
Vector Wind Direction	Takes the instantaneous values of an analog input or from another GSI channel and forms up to three vector-based averages, based on a companion vector wind speed channel. Provides three resultant averages.
Sigma Theta	Takes input from another wind direction channel (standard or GSI) and performs the Yamartino sigma-theta calculation to determine sigma-theta. Gives two resultant averages, with the second being an RMS calculation from the first.
Linear Sigma	Takes the input from any other channel type and performs a linear sigma (square root of standard deviation) calculation. Useful for sigma-W calculations. Provides three resultant averages.
External Channels	The Model 8872 supports a new channel type “E” for External Channels. These allow the user to create a ‘fake’ channel associated with parameter from a directly polled instrument (e.g., BAM, E-Sampler, etc), where the logger is not doing real-time acquisition It exists ONLY to create a channel number for use with logger polling. The External type channel requires no other special configuration, and is ignored by the Site Node Logger process.

Rolling Average	Takes the input from any other channel type and performs a rolling average calculation (e.g., hourly average that rolls on the minute, 8-hour average that rolls on the hour, etc). Only one resultant average.
General Channel	Takes the input from any other channel type and performs determines either the maximum or minimum value of that input during a designated averaging period. If the input interval is set to 1s, the max/min instantaneous reading is recorded, rather than the max/min average. Commonly used for peak wind gust calculations, or max/min daily temperatures.
Rainfall Channel	Takes the input from any Modbus device, calculates the difference before/after any average period, and weights that difference by a designated scaling factor (e.g., 0.01 inches per count). Provides three resultants.

A.1.1 Standard Averaging Channels & Basic Settings For Most Channel Types

Standard averaging channels calculate averages from voltage inputs for up to three unique averaging intervals.

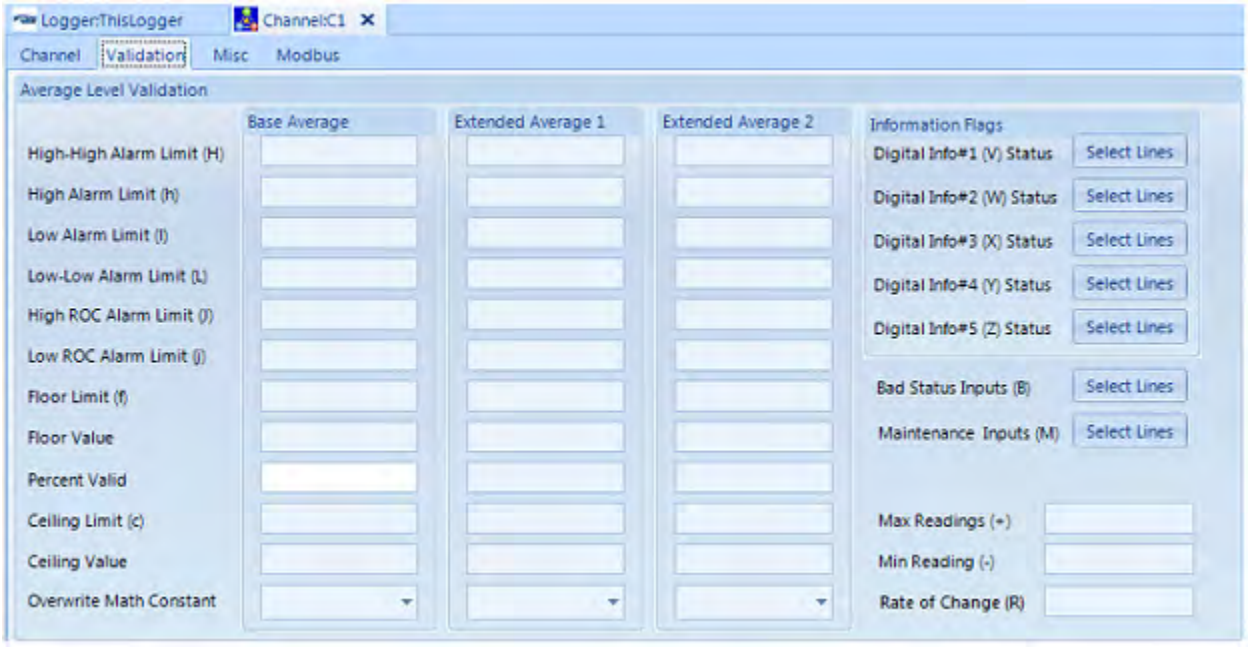
As each voltage or current input is scanned, it is scaled to the appropriate engineering units (EU) (PPM, %, etc.) according to the user's specifications. The first average, called the "base average," is then calculated as the average of all scans (in EU values) for the prescribed interval. If configured, one or two extended averages are then calculated as the average of several base averages, according to each of the other averages' prescribed intervals. If the base average is considered to be invalid due to calibration or some error, that average is not included in the calculation of the other one or two dependent averages.

Specific settings include:

Primary Channel Tab Basic settings for most channel types

- ***Channel Number***
  A number used for ordering channels in the realtime displays; also used in systems polled by central computers as a "channel number" designation. 01 to 99.
- ***Parameter Name***
  Designates the association to the local Parameter within the database.
  Typically the same as Parameter Name, but limited to 8 characters for 8816 / 8832 compatibility.
- ***Channel Name***:
  Typically the same as Parameter Name, but limited to 8 characters for 8816 / 8832 compatibility.

- ***Base Avg. Interval, Storage***
  The first half of the field specifies the interval over which the Model 8872 will average instantaneous readings. Storage time setting is not used in the 8872.
- ***Average #1 Interval, Storage***
  The first half of the field specifies the averaging interval for the Average #1. This interval must be some integer multiple of the Base Average Interval. Storage time setting is not used in the 8872.
- ***Average #2 Interval, Storage***
  The first half of the field specifies the averaging interval for the Average #2. This interval must be some integer multiple of the Base Average Interval. Storage time setting is not used in the 8872.



Validation Tab

Validation Applying to Instantaneous Readings

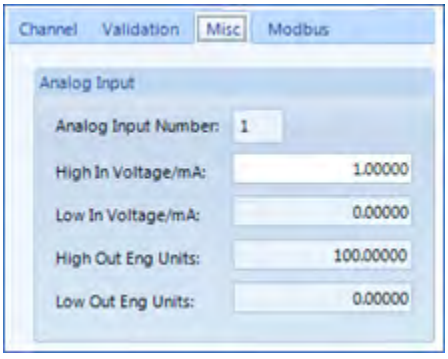
- ***Bad Status Lines (B)***
  Digital Input Pattern which indicates Bad Status for the parameter. The “B” flag will be present with the data when the pattern in this field is true.
- ***Maintenance Status Lines (M)***
  Digital Input Pattern which indicates that the parameter is in Maintenance. The “M” flag will be present with the data when this field is true.

- ***Boiler Offline Status (F)***
  Digital Input Pattern which indicates that the Boiler that this parameter is associated with is Offline. The “F” flag will be present with the data when this field is true.
- ***Maximum Reading Limit (+)***
  Numerical value; if reading is equal to or exceeds this value, the “+” flag will be present with the data.
- ***Minimum Reading Limit (-)***
  Numerical value; if reading is equal to or less than this value, the “-“ flag will be present with the data.
- ***Rate of Change Limit (R)***
  Numerical value; if difference between the previous reading and the current reading is equal to or exceeds this value, the “R” flag will be present with the data.
- ***Digital Info Status #1 (V)***
  Digital Input Pattern which indicates that Status#1 is true. The “V” flag will be present with the data when the pattern in this field is true.
- ***Digital Info Status #2 (W)***
  Digital Input Pattern which indicates that Status#2 is true. The “W” flag will be present with the data when the pattern in this field is true.
- ***Digital Info Status #3 (X)***
  Digital Input Pattern which indicates that Status#3 is true. The “X” flag will be present with the data when the pattern in this field is true.
- ***Digital Info Status #4 (Y)***
  Digital Input Pattern which indicates that Status#4 is true. The “Y” flag will be present with the data when the pattern in this field is true.
- ***Digital Info Status #5 (Z)***
  Digital Input Pattern which indicates that Status#5 is true. The “Z” flag will be present with the data when the pattern in this field is true.

Validation Applying to Average Values

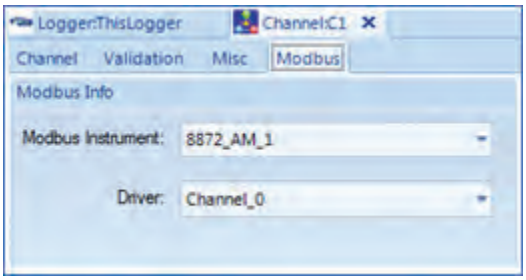
- ***High-High Alarm Limit (H)***
  Numerical value; if average is equal to or exceeds this value, the “H” flag will be present with the data.
- ***High Alarm Limit (h)***
  Numerical value; if average is equal to or exceeds this value, the “h” flag will be present with the data.
- ***Low Alarm Limit (l)***
  Numerical value; if average is equal to or less than this value, the “l” flag will be present with the data.

- ***Low-Low Alarm Limit (L)***
  Numerical value; if average is equal to or less than this value, the "L" flag will be present with data.
- ***High ROC Alarm Limit (J)***
  Numerical value; if the absolute value of the difference between the previous average and the current average is equal to or exceeds this value, the "J" flag will be present with data.
- ***Low ROC Alarm Limit (j)***
  Numerical value; if the absolute value of the difference between the previous average and the current average is equal to or exceeds this value, the "j" flag will be present with data.
- ***Floor Limit (f)***
  Numerical value; if average is equal to or less than this value, the "f" flag will be present with the data.
- ***Floor Value***
  Numerical value; if average is equal to or less than the Floor Limit value, the average will be replaced by this value.
- ***Ceiling Limit (c)***
  Numerical value; if average is equal to or exceeds this value, the "c" flag will be present with data.
- ***Ceiling Valu***e
  Numerical value; if average is equal to or exceeds the Ceiling Limit value, the average will be replaced by this value.
- ***Percent for Valid Average***
  Required percentage (1 to 100) of valid data points during averaging interval for this average to be marked as valid. An average that falls below this percentage will be flagged with < to indicate that it is invalid. **This field will override the setting in the System Configuration**.
- ***Average to Math Constant***
  Not used in the 8872.



Misc Channel Tab

- ***Analog Input***
  Provided for descriptive purposes, but changing this value will not change the data input source (see **Modbus Tab** for details).
- ***High Input***
  Normally, a High Input of 1.0 represents the full 100> scale voltage reading of the instrument. This would normally only be changed for small scaling adjustments.
- ***Low Input***
  Normally 0, Low Input represents the low value reading for the instrument. This would normally only be changed for small scaling adjustments.
- ***High Output***
  The instrument reading in engineering units corresponding to the **High Input**.
- ***Low Output***
  The instrument reading in engineering units corresponding to the **Low Input**.
- ***Modbus Instrument***
  Designates which external instrument or internal I/O module is used for the instantaneous reading.
- ***Driver***
  Designates which parameter or module I/O point is used for the instantaneous reading.



Modbus Tab

A.1.2 Channel Configuration Settings for Other Channel Types

Most of the configuration form for channels is the same as that for the Standard Channel. Settings that are specific to a channel type are generally found in the "Misc" tab and are as follows:

A.1.2.1 Modbus / GSI

The settings for this channel are the same as those for the Standard input channel, except the scaling factors tab has been removed. It is assumed that the Modbus device is providing scaled engineering unit values as part of their input.

A.1.2.2 Vector Wind Speed / Direction

The settings for this channel are the same as those for the Standard input channel, an additional pick list is provided to designated the Companion wind speed / direction channel (e.g. for the wind speed channel, designate the wind direction companion, and vice versa). Note that this will mean setting one channel up initially without the companion defined, setting the second channel, and then going to the first to define the companion channel setting.

A.1.2.3 Sigma Theta

Channel Tab

- ***Sigma-Theta Average***
  This sets the initial sigma-theta calculation interval, typically 15 minutes.

Misc Tab

- ***Average Interval***
  This sets the final average interval (typically one hour), which is made from an RMS calculation of the "Sigma Theta Average Interval".
- ***WDR Input Channel Number***
  This designates the report channel number of the WDR channel to use as input. It may be a scalar or vector WDR channel, or actually any channel type.

A.1.2.4 Linear Sigma

The settings for the Linear Sigma channel are the same as those for the Standard input channel, except that the scaling tab is gone, and there is only one setting in the Misc tab:

- ***WDR Input Channel Numbe***r
  This designates the report channel number of the WDR channel to use as input. It may be a scalar or vector WDR channel, or actually any channel type.

A.1.2.5 Rolling Average

Misc Tab

- ***Input Channel***
  Defines which channel is to be used for the input of the rolling average. It may be of any channel type.
- ***Input Interval***
  Defines the input interval for the rolling average calculation. This will also define the rate at which averages are stored for the rolling average.
- ***Duration***
  This designates length of the rolling average "buffer", or how many averages are used in the rolling average calculation. Invalid averages are kept in the buffer, but not used in the resultant calculation.
- ***Exclude Offline Data***
  Not used in the Model 8872
- ***Clear At Rolling Interval***
  This tells the logger to "clear" the rolling buffer at the end of the duration interval. This is commonly used for 'building' averages that wish to be reset every hour, day, etc.
- ***Storage Time***
  Not used in the Model 8872

A.1.2.6 General Channel

Misc Tab

- ***Input Channel***
  Defines which channel is to be used for the input of the calculation. It may be of any channel type.
- ***Input Interval***
  Defines the input interval for the rolling average calculation. This will also define the rate at which averages are stored for the rolling average.
- ***General Value Duration***
  This designates length of the period for which the calculation is to be performed. E.g., to find the highest 1 minute average in an hour, the Input Interval would be 1 minute, but the General Value Duration would be 1 hour.
- ***General Value Storage Time***
  Not used in the Model 8872
- ***Data Channel Type***
  May be defined as "Maximum" or "Minimum".

- ***Ignore Input Channel Flags***
  Defines flags that, if found on the input interval, cause that average to be ignored for calculation purposes.

- ***Reset Input Status Pattern***
  Defines a digital input pattern that can be used to "reset" the minimum or maximum recorded so far in a period.

A.1.2.7 Rainfall

The settings for the Rainfall Channel are the same as those for the Standard input channel, except that the scaling tab slightly modified:

- ***Counter Input***
  Defines the number of counts that correlate to the Counter Output (typically "1.0").

- ***Counter Output***
  Defines the engineering units that correlate to the Counter Input setting (typically 0.1 or 0.01 inches, mm, etc).

Appendix A.2 Calibrations

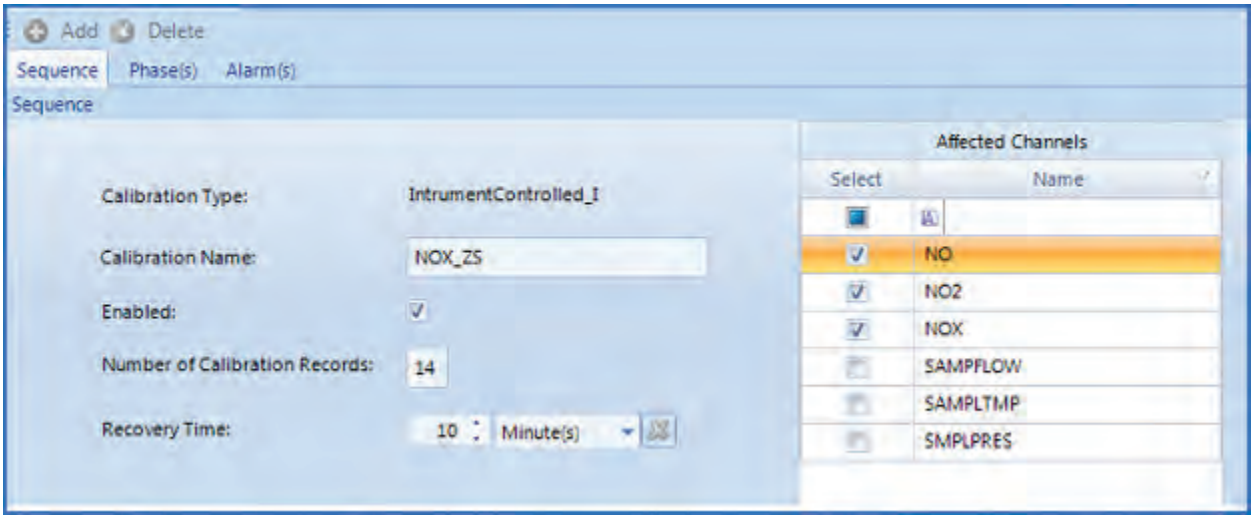
The Model 8872 follows the 8816 / 8832 approach to calibrations, where calibrations are defined as their own entities, and store data in calibration result records (rather than just flagging fine-resolution data). The Model 8872 supports four models of calibration, distinguished by how they are initiated and timed/controlled:

Calibration Type	*Description*
Automatic Calibration	Logger initiates the calibration at a pre-programmed time, repeats on a set interval, and controls the timing of the calibration through activating physical outputs on the Model 8872, or remote outputs via Modbus link to calibrators, instruments, etc.
Instrument Initiated	Similar to the Automatic Calibration, except that rather than having a start time and repeat interval, the user defines a start status input pattern (physical on 8872 or via remote Modbus I/O). When the correct pattern is seen, the calibration starts. It does not repeat again until the start pattern is seen again. Usually used for a "pushbutton" cal, or to follow a programmed timing from an instrument that can only provide an "in calibration" status signal.
User Initiated	Similar to the Automatic Calibration, except the calibration is only begun using the "start calibration" function in the Model 8872's user interface.
Instrument Controlled	Logger follows the phases of a calibration via physical or remote status inputs, with a unique pattern defined for each phase. Instrument controls all of the timing, but the user can define the window of time at the end of each phase for which the data is taken (e.g., "take the last 90 seconds as data"). Usually used to follow sequences programmed into calibrators, where the calibrator sends a pattern via physical inputs or Modbus.

All calibrations have a Recovery stage at the end of the cal, during which data is invalidated, but is not associated with any input patterns or control outputs. This is to represent the time for the system to return to normal sampling condition.

All calibrations also have a list of **Affected Channels** that defines which parameters are to be invalidated during the calibration. Generally, the parameters are the same as the list of **Data Channels** (for which we record data), but there are some cases where a 1:1 correlation does not exist, for example, and SO2 calibration through a common gas manifold may require that other gas parameters be marked invalid.

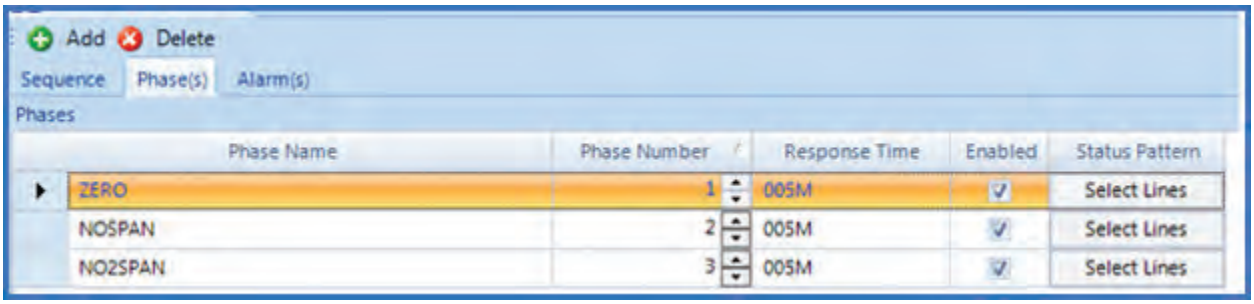
Other calibration sequence properties may include:



Cal Sequence Properties

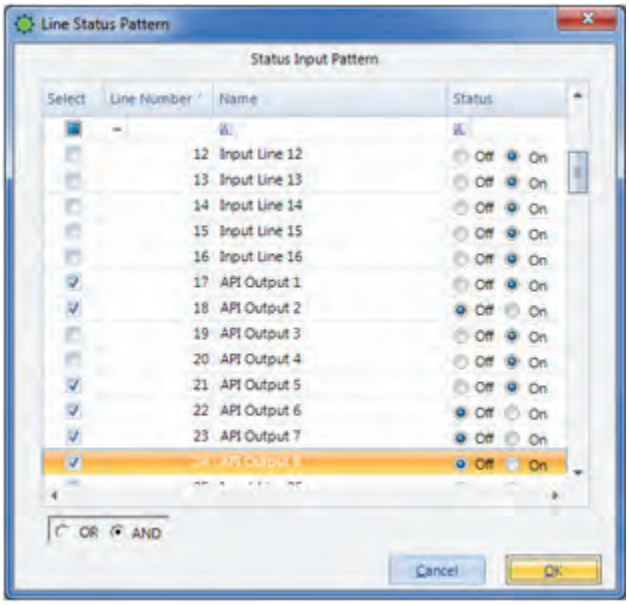
- ***Name of Cal Sequence***
  The label used to identify this calibration program.
- ***Enabled:***
  Can be used to activate / deactivate the calibration program.
- ***Starting Time (Automatic)***
  The month, day, and time that the data system controller should begin this calibration sequence.
- ***Interval (Automatic)***
  How often this calibration sequence should repeat; usually every 24 hours (1d).
- ***Start Pattern: (Instrument Initiated)***
  Defines the status input pattern that starts the calibration.comcast.net

Within the **Phase** settings, properties may include:



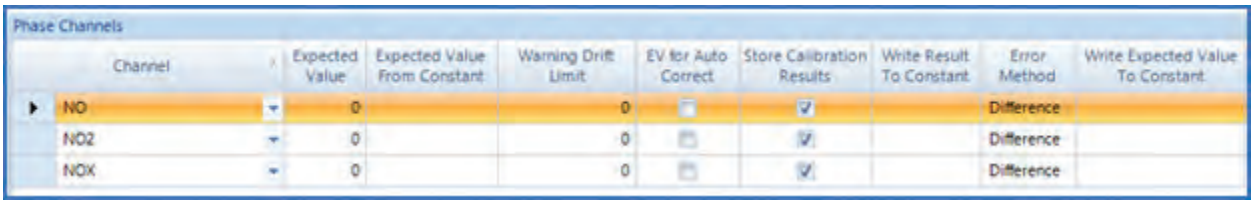
Phase Settings

- ***Phase Name***
  The label used to identify this calibration stage/phase (e.g., Zero, Span, Prec)
- ***Phase Number***
  Defines the order of the phases in which they run (not used for Instrument Controlled calibrations, as their phases can occur in any order).
- ***Duration Time (Automatic, User Initiated, Instrument Initiated)***
  The period of time that the control outputs for that phase will be set.
- **Response Time**
  The window of time at the end of that phase in which readings are averaged to form the resultant value for that phase.
- ***Status Pattern***
  Defines the status output or input pattern associated with that phase. For input patterns, the user should define which inputs are to be observed, and if they should be closed or opened for that pattern. **The pattern for each phase and calibration should be unique.**



Line Status Pattern for Phases

For each Phase Channel (combination of phase and recorded channel), the properties include:


Phase Channels

Channel	Expected Value	Expected Value From Constant	Warning Drift Limit	EV for Auto Correct	Store Calibration Results	Write Result To Constant	Error Method	Write Expected Value To Constant
NO	0		0	☐	☑		Difference	
NO2	0		0	☐	☑		Difference	
NOX	0		0	☐	☑		Difference	

Phase Channel Properties

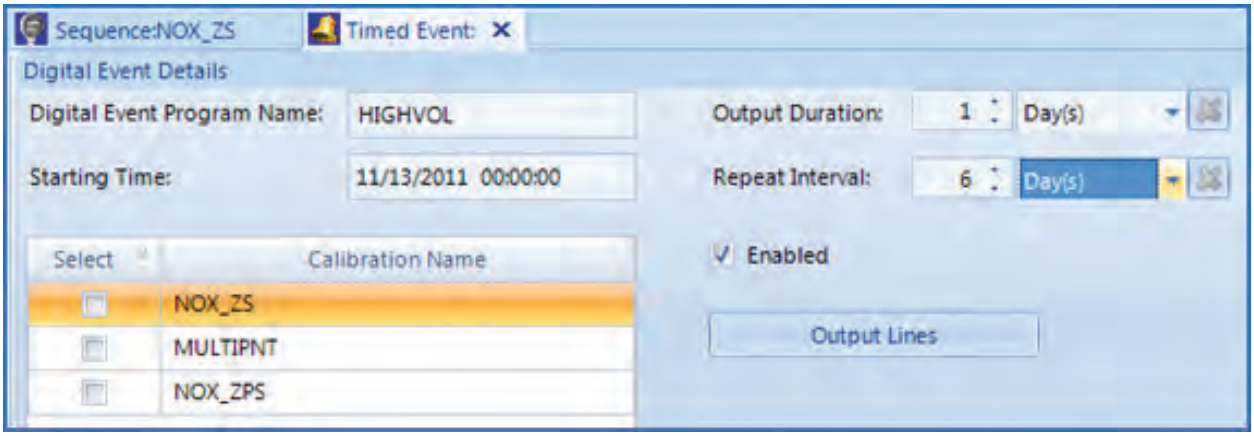
- ***Channel***
  Which parameter(s) are to be recorded for this phase
- ***Expected Value***
  The target value for the instrument during this phase.
- ***Expected Value From Constant***
  Not used in the Model 8872
- ***Warning Drift Limit***
  The user can define an absolute value difference between the observed value and the expected value and, if this limit is exceeded, an alarm output can be set.
- ***EV for Auto Correct***
  Not used in the Model 8872 (at this time)
- ***Store Calibration Results***
  Normally set, this can be used to inhibit recording a value that is taken for some other purpose (e.g., Write Value to Constant).
- ***Expected Value From Constant***
  Not used in the Model 8872
- ***Error Method***
  Used to designate the error method used for the Calibration Result. Choices are
  Standard: Shows cal error as ABS(difference) / Cal Span
  Difference: Shows cal error as actual difference of engineering units
  Linearity: Shows cal error as ABS(difference) / Expected Value

Appendix A.3 Digital Event Programs

The Digital Event feature allows the user to specify a digital control output event. A digital event program can be either timed or triggered by a digital input.

For example, a digital event program could be described as: Starting at 7:30 PM on July 6, turn digital outputs 13 and 14 on, leave them on for 75 minutes, and repeat this sequence every third day.

For a timed digital event program, the start time and repeat interval for the digital output(s) event are specified, much like an automatic calibration. Other definitions include:



Timed Digital Event

- ***Output Control Line(s)***
  The list of the relay outputs that should be activated at the start time.
- ***Output Duration***
  The length of time that the Output Control Line(s) will be activated. After the Output Duration, the lines will return to their inactive state. 5s to 999 s, m, h, or d (for seconds, minutes, hours, or days, respectively).
- ***Disable During Calibration(s)***
  The list of calibration program names during which the digital program will update its Starting Time but will not activate output lines. This option allows calibrations to override normally programmed sequence.
- ***Serial Port, Output String (Triggered GSI)***
  When the sequence is triggered, the designated string will be sent out the serial port

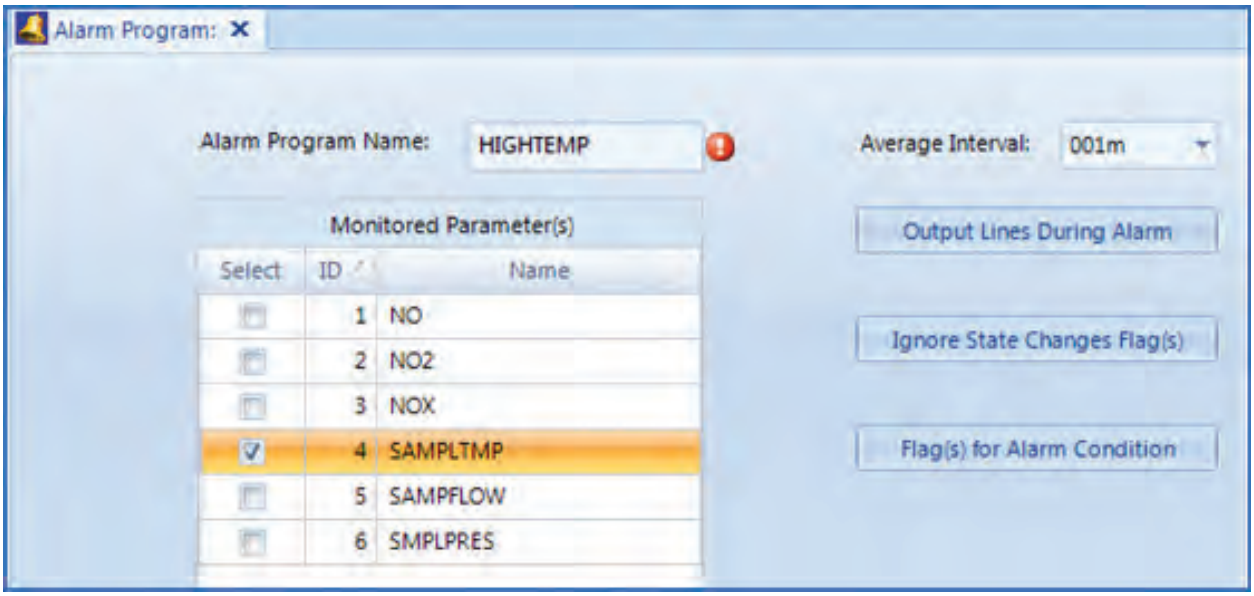
For Digitally Triggered digital event programs, a digital input pattern is specified that will initiate the digital output(s) event (much like an Instrument Initiated Calibration). The output lines will remain on in their active state for the specified duration. At the end of this time, the output lines will be deactivated unless the triggering digital input pattern is still true.

Appendix A.4 Average and Calibration Alarms

Although AirVision and the 8872 component contains an alarm checking system, these programs are used primarily to send e-mail notifications. In some cases, it may be necessary to activate a physical relay or switch a Modbus digital point based on a calibration result. For these actions, the Model 8872 supports the same local logger alarm programs as the Model 8816 / 8832 data loggers.

Appendix A.4.1 Average Alarms

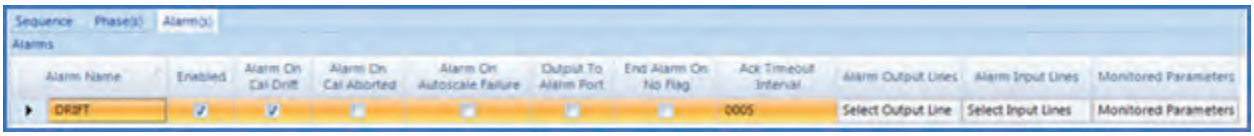
Logger Average Alarms are set in the **Logger Channels** screen, using **Add > Average Alarm**. In the same manner as the AirVision/ 8872 alarms, the user designates the parameter(s) to be observed, the average interval, the triggering flag(s), and potentially a list of flags that might inhibit the alarm condition (e.g., maintenance, calibration). The only addition is that the user can set the **Output Lines During Alarm** (similar to setting relay outputs for a calibration). These relays will be turned on during the alarm condition, and remain set until the alarm condition goes away.



Alarm Program configuration

Appendix A.4.2 Calibration Alarms

Calibration alarms are set as part of the calibration configuration, using the **Alarms** tab and the **Add > Alarm** button. The user would designate:



Calibration Alarm configuration

- ***Alarm Name***
  The name to distinguish different cal alarm programs.
- ***Enabled***
  Allows the alarm to be temporarily disabled.
- ***Alarm On Cal Drift***
  If set, the alarm will be triggered if any of the Monitored Parameters are found to have a difference between measured value/result and Expected Value to be greater than the drift limit for that channel / phase.
- ***Alarm On Cal Aborted***
  If set, the alarm will be triggered if the calibration sequence is aborted before it complete.
- ***Alarm On Autoscale Failure***
  If set, the alarm will be triggered if “EV for Auto Correct” is set, but the data logger cannot mathematically calculate a rescaling adjustment.
- ***Output to Alarm Port***
  Not used in the Model 8872.
- ***End Alarm on No Flag***
  Not used in the Model 8872.
- ***Ack (Acknowledge) Timeout Interval***
  Not used in the Model 8872.
- ***Alarm Output Lines***
  Used to define which relays / Modbus outputs are to be turned on when the alarm condition is found.
- ***Alarm Input Lines***
  Not used in the Model 8872.
- ***Monitored Parameters***
  Used to set the list of calibration parameters that are observed for calibration purposes (may be a subset of the total list of calibrated parameters).

Application Notes

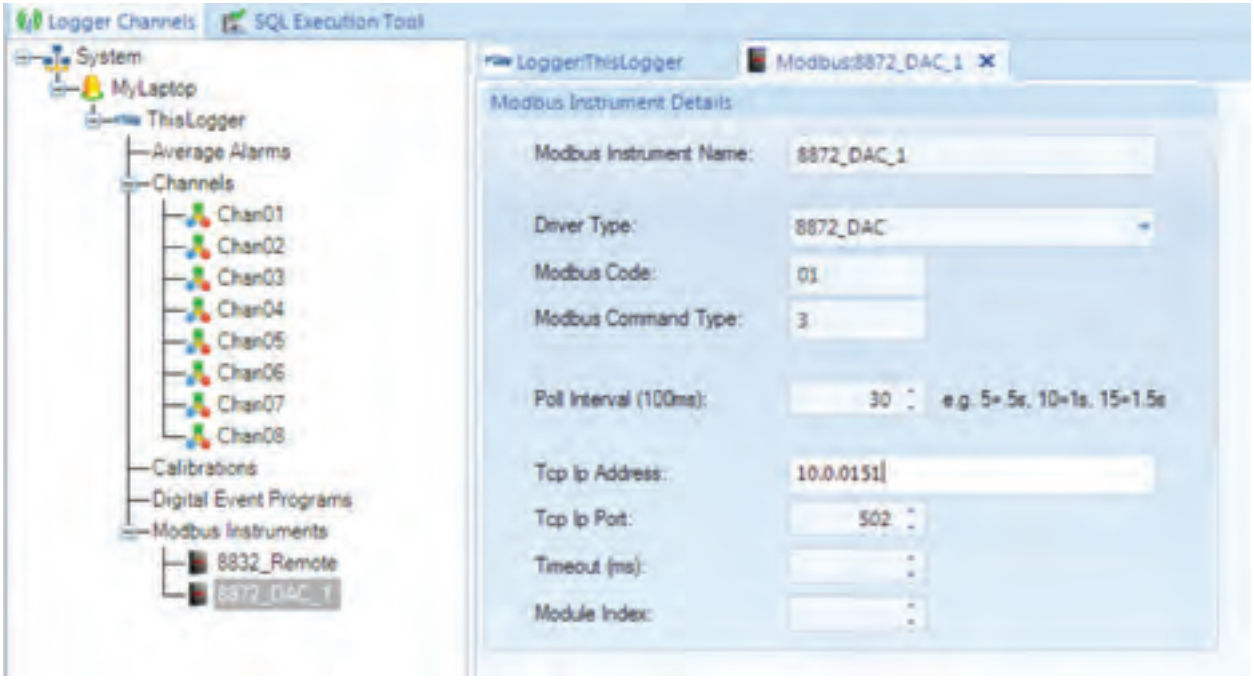
Appendix B.1 Setting up Analog Outputs on the Model 8872

The Model 8872 does not use any custom analog output boards, but rather has the capability to talk to a wide variety of Modbus-based analog output modules commonly available. The most common we use (and the one for this illustration) is the Acromag 972/973EN-4004 device.

If purchased from Agilaire, the units will be preprogrammed with IP addresses compatible with the Model 8872's External I/O network. The first module will be 10.0.0.151, the second will be 10.0.0.0.152, etc.

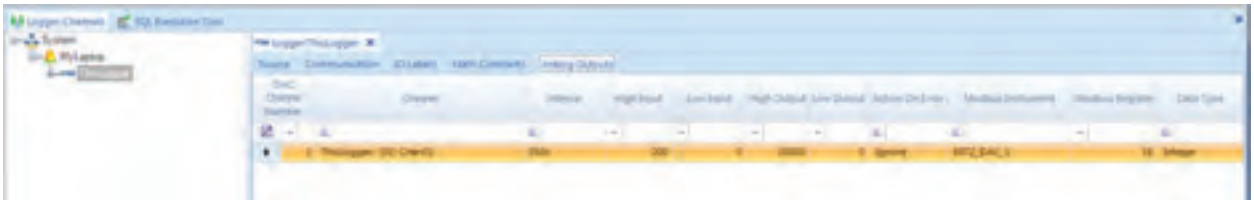
The unit is DIN-rail mounted, and must be given a 15-36 VDC power supply (not provided by 8872, typically a DIN rail power supply). The user should then connect the module to the "External I/O" network (rear panel) through a basic passive Ethernet switch:

Next, create a Logger Modbus Device under Configuration->Logger Channels using the supplied driver:



To set the analog output function for each particular analog output channel open the "Analog Ouputs" tab. To create a new analog output program, use the bottom row (with the '*' asterisk) and enter in the fields:

- DAC Channel Number (1, 2, 3, etc)
- Channel (Logger)
- Average Interval to transmit/update (001s for instantaneous)
- Low/High- represents upper / lower engineering units to be output (e.g. 0 to 500 ppm)
- Low/High Output – set to 0 and 20,000 for Acromag devices.
- Action On Error- set to either Ignore, Zero (drive to zero value), Hold, or LowVal (e.g., 4mA).
- Modbus Instrument- associates with Modbus device.
- Modbus Register: For Acromag, use:
- Data Type: Integer

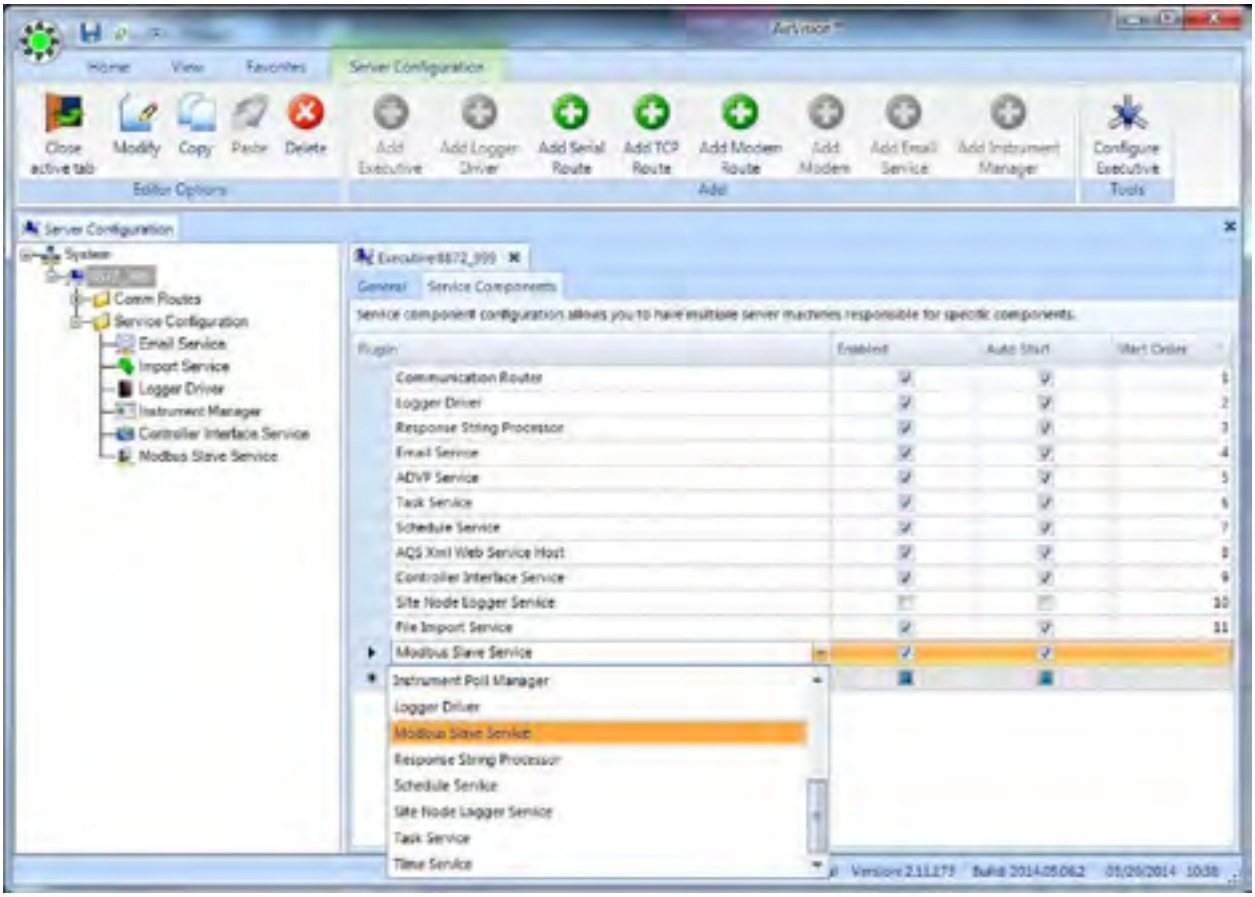


Allow the Site Node Logger service to restart, and the analog output should begin to drive the desired value.

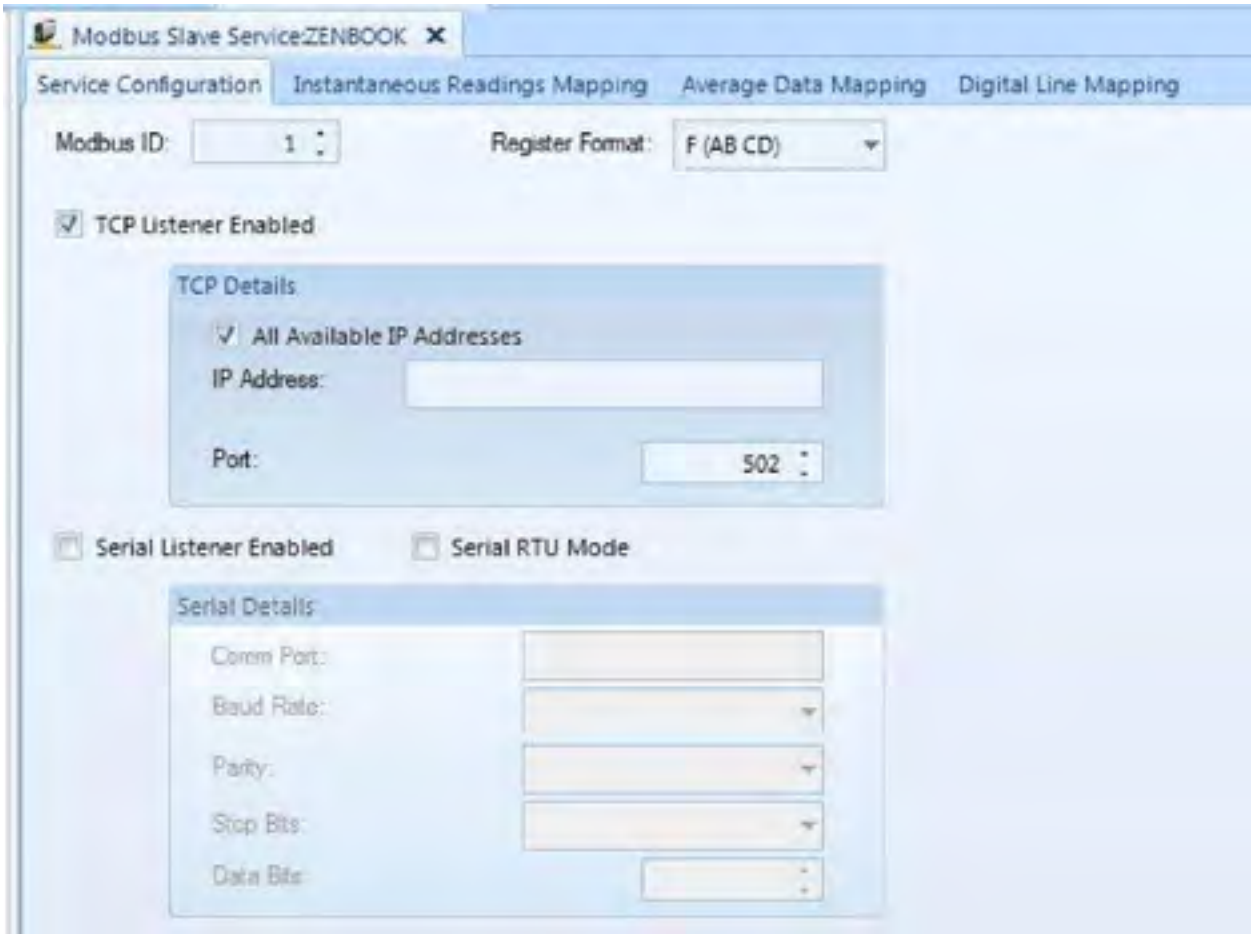
Modbus Slave Plug-In

This plug-in allows for the Model 8872 to act as a Modbus Slave/Server on the network and provide data from the Model 8872 to a distributed control system (DCS) or SCADA system.

To enable the plug-in, go to **Configuration->PC Configuration**, double click on the logger entity, and open the **Plug-Ins** tab. Select a new plug-in, and select **Modbus Slave Service**.



Save, and allow the service to restart. The left side panel will now show an item for the new service. Double-click on it to open the properties:

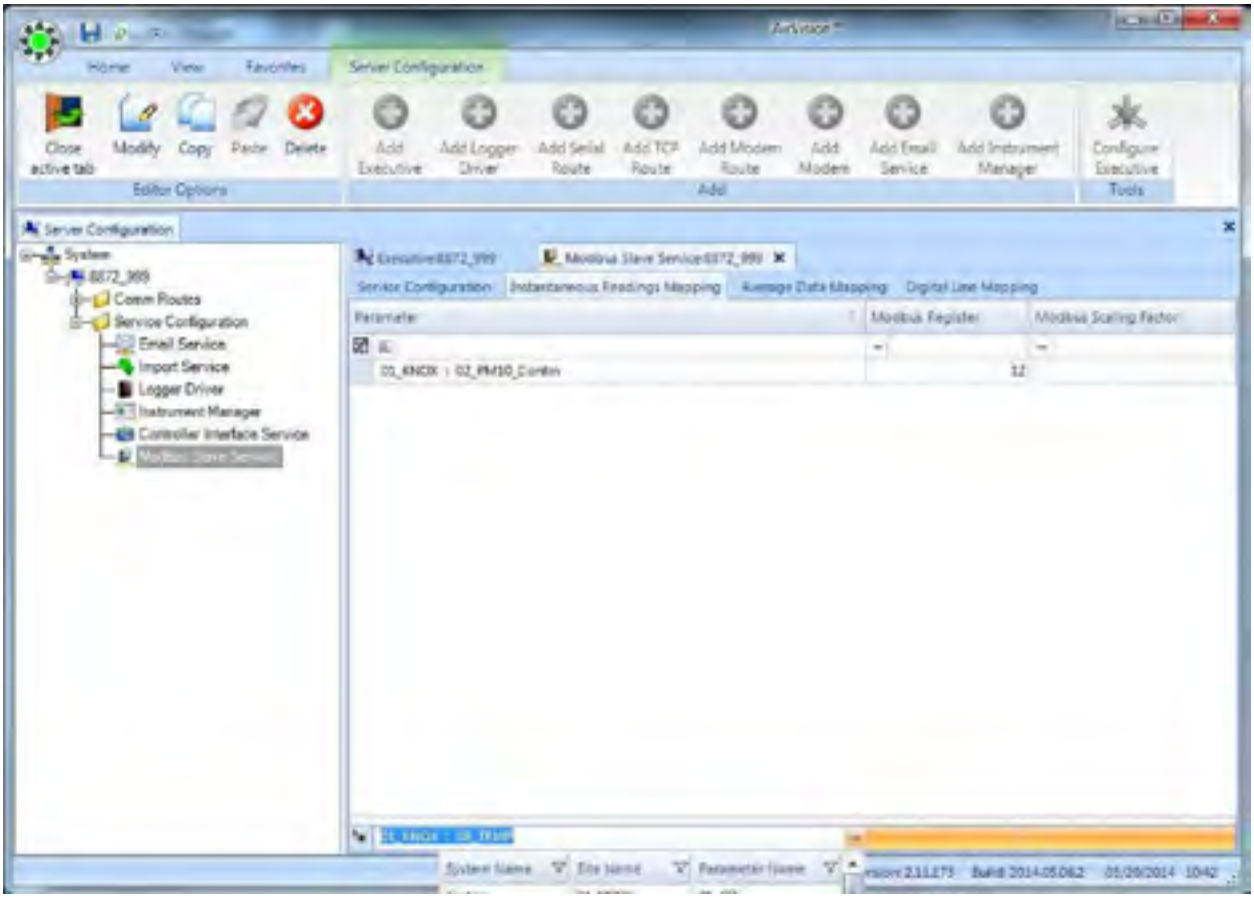


From here, we can set the Modbus ID (required by some DCS/SCADA systems), the default format for floating point numbers (consult DCS/SCADA guidelines), or if you wish to portray the data as 16-bit integers (RTU). You may also define whether you wish to use one of the RS-232 ports as well as the standard TCP Port 502.

From here, we can set the Modbus ID (required by some DCS/SCADA systems), the default format for floating point numbers (consult DCS/SCADA guidelines), or if you wish to portray the data as 16-bit integers (RTU). You may also define whether you wish to use one of the RS-232 ports as well as the standard TCP Port 502.

Once you have made these settings, you can go into the other three tabs and create the 'tags' that you wish to portray to the DCS/SCADA system. These include instantaneous readings and averages (represented as registers) or digital inputs (represented as coils).

Click in the * section at the bottom of the screen to add a new tag:



The scaling factor is only used when the default register format is set to 16-bit integers, otherwise it is ignored / does not need to be set. The scaling factor is used to convert values to integers (and the appropriate logic will need to be set on the DCS/SCADA end as well):

Integer Value = Floating Point Value / Scaling Factor.

Thus, a scaling factor of 0.01 will convert a value of 1.23 into integer '123'. Values are rounded.

Coils are simply mapped to a status input point and only take up one “number” space each: